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FAA CERTIFICATION PROCESS AND REGULATION OF ILLEGAL COMMERCIAL OPERATORS

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HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON GOVERNMENT OPERATIONS HOUSE OF REPRESENTATIVES

NINETY-FIFTH CONGRESS

SECOND SESSION

SEPTEMBER 26 AND 28, 1978

Printed for the use of the Committee on Government Operations

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
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FAA CERTIFICATION PROCESS AND REGULATION OF ILLEGAL COMMERCIAL OPERATORS

TUESDAY, SEPTEMBER 26, 1978

HOUSE OF REPRESENTATIVES,
GOVERNMENT ACTIVITIES AND
TRANSPORTATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9:10 a.m., in room 2247, Rayburn House Office Building, Hon. John L. Burton (chairman of the subcommittee) presiding.

Present: Representatives John L. Burton, Glenn English, David W. Evans, Anthony Moffett, Jack Hightower, Robert S. Walker, and Arlan Stangeland.

Also present: Bruce R. Butterworth, professional staff member; and Rachel Halterman, minority professional staff, Committee on Government Operations.

Mr. BURTON. The subcommittee will come to order.

We are dealing today with FAA's certification of transport category aircraft, and FAA's regulation of illegal commercial operators.

But, first of all, I would like to make this comment.

All of us are aware of the tragedy that occurred yesterday over San Diego. More than 140 persons, including a personal friend of mine, lost their lives in the mid-air collision between a 727 and a small general aviation aircraft.

I realize that that is partly why there is such an interest in these hearings this morning.

There is a valid need for information about the accident, and about what Congress will do to prevent such future accidents. The National Transportation Safety Board, which has the statutory authority to investigate these accidents, commenced its investigation this morning. The Acting Chairman of NTSB will testify today and will provide us with whatever up-to-date, confirmed facts are available.

Coincidentally, in response to a request from the subcommittee, the Air Line Pilots Association submitted, over 2 weeks ago, analyses of four cases showing failures of the certification process, which is the main subject matter of these hearings. One of those cases was FAA's failure to develop and implement a collision avoidance system.

Certainly, viewed in hindsight, this is sadly prophetic. Perhaps—and we do not know all of the facts—this accident could have been prevented had there been an effective collision avoidance system installed in those aircraft. We cannot determine yet the approximate cause of the accident because we simply do not have all of the facts. I do hope that the public and the members of the media present will

understand and respect this. Hopefully, we will know more by Thursday, when Mr. Bond, the FAA Administrator, will testify. We will have questions for Mr. Bond concerning the accident.

If it does turn out that this accident could have been prevented by a collision avoidance system, and if it turns out that FAA has been dilatory in implementing this system, we certainly will have something to say. I am sure that will lead to more hearings and greater action on the part of this subcommittee.

This subcommittee has had a long and distinguished record of investigation in the area of preventing mid-air collisions, which dates back to the times when Jack Brooks was our chairman. But, this particular accident will be especially etched into the record, and certainly we as a subcommittee of Congress and, I, as a person, will not forget the accident. Certainly it will be foremost in our minds when Mr. Bond testifies on Thursday.

Today's and Thursday's hearings consider two distinct but very important FAA duties: The certification of transport category aircraft used by airlines, and the regulation of "illegal" commercial operators who evade compliance with safety rules governing commercial operations.

The certification process, which is the very foundation of aviation safety, is a process through which standards are set and aircraft and equipment are tested against those standards. The FAA makes its most important decisions about an aircraft during that process—decisions which will either guarantee the highest possible level of safety in air transportation, or something less than that. During this process the aircraft is not only certificated as airworthy, but FAA also establishes in specific documents how the aircraft should be used and maintained. These documents are as important as rules contained in the Federal Air Regulations.

This, in itself, gives us enough reason to examine the process. Another reason is that the process has been challenged by a number of organizations. Congressional committees, including this particular subcommittee under the chairmanship of Jack Brooks in the recent past, have questioned particular aspects or results of the certification process.

Within the last year, the Air Line Pilots Association has initiated a drive for an open certification process and has raised new questions about the FAA's ability or willingness to prevent hazards to aviation safety during certification.

The FAA has responded vigorously, denying all allegations that safety has been compromised, and has charged instead that opening up the process would only create needless delay and commercial harm to important U.S. manufacturers through the release of proprietary information.

This subcommittee's overriding concern is to determine whether the present process has created aviation safety hazards. Such a task will require many more days of hearings and much more research by the subcommittee and its staff. To assist us at this time we have asked a variety of witnesses to testify: The FAA, which established the process; the National Transportation Safety Board, which, since it must investigate all air carrier accidents, should know better than any

other organization whether or not the process has jeopardized aviation safety, the aircraft manufacturers, represented today by the Aerospace Industries Association of America; the air carriers, represented by the Air Transport Association of America; and finally, the people who are on the line every day, the Air Line Pilots Association, along with the Association of Flight Attendants, who have many complaints to make on this process as they see it affect safety as they perform their work.

To help provide points of discussion, the subcommittee took the unusual step of requesting a nongovernmental witness, ALPA, to submit, in writing, in advance of the hearing, descriptions of at least four instances where the certification process has resulted in hazards to aviation safety. These written submissions were then circulated and made available to all the other witnesses.

To determine whether aviation safety has been endangered is one thing. But we must also decide whether future hazards can be prevented by allowing responsible, interested parties reasonable access to the process.

It is not good enough to say that the process should be opened, once the need for such a step has been established. It is also necessary to think about how it should be opened and what that process should involve.

Who should be designated interested parties? When and where should there be public hearings? Will interested parties be content to see performance data, or do they require more intricate knowledge of a particular system? How could full and adequate testing be assured, instead of endless testing, if a dispute arises about a particular system?

We will also examine the FAA's efforts to prevent private owners of large aircraft, usually surplus airliners, from going commercial without being certificated by either the FAA and CAB, and in the process evading all applicable safety standards.

This problem has been known for many years, and it has been referred to by some colorful names. The best known is a name for a place called Cockroach Corner. It refers to a specific corner of Miami International Airport, where the bulk of these operators are apparently located.

The subterfuges used by these operators are quite imaginative. They include dummy or double corporations, foreign air carriers or operators, special arrangements where unknowing passengers become guests of a hotel or a casino, as opposed to a passenger on an airline.

They are also very dangerous because the sole motive of the operator is to reap the benefits of the commercial operation without paying the price of compliance with safety rules set out in Federal Air Regulations Part 121. As a result of this, a horrendous safety record has been compiled, and it is apparently getting worse. Since January of this year alone, there have been six crashes. In addition, these operators present an unfair economic competition to the legitimate certified operators who play by the FAA safety rules.

The Cockroach Corner problem is not new, but the subcommittee decided earlier this year that it needed reexamination to see what the FAA was doing about it and to see if the FAA was doing all it could or should to correct this situation.

GAO investigators were requested to go into the area and are now prepared to submit their preliminary findings. Their description of the problem will be the most current available analysis of the FAA's regulatory efforts, and it may well give us reason to criticize the agency. But, it may also give us reason to try to eliminate some of the hindrances that FAA faces in dealing with the outlaw-type operators who want to make a fast buck rather than the legitimate airlines who are expected to, and do heed safety requirements.

We have a long series of witnesses for today and Thursday, but at this time I will yield to the ranking minority member, Mr. Stangeland of Minnesota, for any comments he may wish to make.

Mr. STANGELAND. I am pleased to participate in the hearings with you. This is a subject which needs to be looked into. Airline safety is crucial and critical to the citizens of this country. We want to assure them that we have done everything in our power to make airline travel safe. Beyond that, I have no further remarks at this time.

Mr. BURTON. Thank you.

Mr. Hightower?

Mr. HIGHTOWER. Mr Chairman, I am glad you pointed out in your opening remarks that these hearings have been set for some time. Preparations have been going forward. It is not a result or a response to the tragic accident of yesterday.

It is a continuing concern on the part of Congress and of this committee in the whole area of airline safety.

I have examined the witness list. I look forward to hearing the testimony of these witnesses. I appreciate the chairman's setting up the hearings.

Mr. BURTON. Thank you.

Our first witness will be Capt. J. J. O'Donnell, president, Air Line Pilots Association. He will be accompanied by Captain DeCelles, Captain Melvin, and Mr. Cotton.

I would say for all of the witnesses that we do have your prepared statements. In the interest of time, and so that we can get down to some of the nitty-gritty questioning, we would appreciate it if you would submit your statements for the record, and if possible, summarize the high points of your testimony.

Please proceed, Captain.

STATEMENT OF CAPT. JOHN J. O'DONNELL, PRESIDENT, AIR LINE PILOTS ASSOCIATION; ACCOMPANIED BY CAPT. J. L. DE CELLES; CAPT. WILLIAM W. MELVIN; WILLIAM B. COTTON; AND JOHN E. O'BRIEN

Captain O'DONNELL. Thank you, Mr. Chairman.

I am Capt. John J. O'Donnell, president of the Air Line Pilots Association International, or ALPA, which represents the professional interests of more than 30,000 pilots employed by 35 air carriers in the United States. Our members constitute more than half of the airline pilots in the world.

Accompanying me today are Capt. J. L. DeCelles, chairman of the All Weather Flying Committee; Capt. William W. Melvin, chairman of the Airworthiness and Performance Committee; and William B. Cotton, chairman of the Air Traffic Control Committee.

In addition to these three gentlemen whom you mentioned, we also have John E. O'Brien, manager, engineering and air safety department of ALPA.

In addition to our statement we have two presentations we would like to make: the showing of a film and the showing of a slide.

We are very grateful for this opportunity to present our views on the process by which the Federal Aviation Administration certificates airline aircraft, systems, and components, and how this process—which is vital to public safety—could be improved.

Before I begin, let me dispel the nefarious notion that our real goal in seeking an improved certification process is not to improve aviation safety but only to see that future airliners have three crewmembers in the cockpit.

ALPA does believe that safety requires three crewmembers in future transports and that the FAA has not adequately studied the question of crew complement before certificating aircraft in the past. Nevertheless, there are so many other weakenesses in the current certification process that I see no need to address the issue of crew complement at this time. To do so would only serve the interests of the manufacturers and some parties of the FAA who have diligently sought to divert attention away from the defects of the certification process by their cries of "featherbedding."

With your permission, Mr. Chairman, we would prefer to bypass any discussion of the crew complement question as it relates to certification and will focus on the numerous other deficiencies in the certification process.

In your letter inviting me to testify, Mr. Chairman, you wrote that certification of transport aircraft is "one of FAA's most important duties." You also said:

> The certification process creates the foundation of aviation safety: It is the Government's determination, presumably made after exhausting testing and analysis in all possible operational conditions, that aircraft and equipment are safe enough to insure the possible level of safety in air transportation.

We agree, Mr. Chairman, that certification of airline transports is one of the FAA's most important duties, but we must respectfully submit that its administration of certification does not insure the high possible level of safety. Instead, what is attained is the level of safety that the manufacturers can induce the FAA to accept.

Our alarm over the deficiencies of the FAA in certification intensifies as we contemplate the soaring growth in commercial aviation forecast for the remainder of the century. The FAA estimates the number of aircraft in this country will grow from 185,000 now to as many as 375,000 by the year 2000. Controlled takeoffs and landings, which now number approximately 64 million annually, are expected to reach 118 million by the end of the century.

This growth will impose more challenging and demanding requirements on aircraft engineers and flightcrews to design and fly transports with hundreds of passengers in an increasingly crowded and complicated environment.

Yet the standards and the process by which the FAA will certificate the transports of tomorrow are dated by a generation. The agency has been unconscionably slow in applying current technology to aircraft certification.

ALPA has sought to persuade the FAA, the Transportation Department, and the White House that the certification process must be strengthened and improved. Transportation Secretary Adams and FAA Administrator Bond have ignored and rejected our pleas.

We suspect one reason for this rejection is the protective relationship between the FAA—the regulator—and the manufacturers it is charged to regulate. This relationship means that the traveling public gets less than the highest level of safety and stems from the dual missions of the FAA.

The agency must "encourage and foster the development of civil aeronautics and air commerce in the United States and abroad" and also must "promote safety of flight * * *." These are quotations from sections 305 and 601, respectively, of the Federal Aviation Act.

Thus, safety is bound to suffer when the FAA attempts to balance it against such economic factors as the costs of airplanes.

This problem of the FAA's protective attitude toward the industry it is mandated to regulate is not new, Mr. Chairman. It has been well documented in the past by this committee and others in Congress.

To cite just one example, the Special Subcommittee on Investigations of the House Committee on Interstate and Foreign Commerce reviewed the FAA's performance and reported in January 1975:

> Unlike some other agencies of the Government, whose responsibilities center on economic regulation, the responsibilities of the FAA directly involve human life and safety.
>
> For this reason, it is somewhat unfortunate that the task of the FAA has been traditionally described as twofold: To foster aviation safety on the one hand, while promoting civil aviation itself on the other. The subcommittee has noted a tendency within the agency to view these responsibilities as if they were competing interests to be balanced off against each other. There have been instances when appropriate FAA actions in furtherance of air safety have been unreasonably delayed, or omitted entirely, because of an oversolicitous attitude on the part of some within the agency concerning the economic well-being of the aircraft industry or the air carriers.

The subcommittee concluded:

> Therefore, agency decisions which compromise safety in favor of apparent short-term factors affecting the industry, apart from their threat to the public safety, do not serve the real economic interests of the aviation industry. The attempt to balance dollars against lives benefits no one.

There are far too many examples of how safety has been compromised in the certification process. There is ample and expert documentation available in congressional hearings and reports and elsewhere to support these findings:

The FAA frequently compromises its own regulatory procedures. Manufacturers self-regulate. Private deals have been used in lieu of enforcement directives between the FAA and the manufacturers.

Vital safety information that should flow freely and quickly between aircraft manufacturers, their subcontractors and the FAA is often blocked to protect designers, engineers, or inspectors.

Aircraft equipment problems and operational hazards are not always reported by the airlines to the FAA and are not required to be reported by the manufacturers.

There is no clear-cut authority or responsibility for the issuance or enforcement of safety directives concerning aircraft in service or to insure engineering changes are made when deemed necessary for safety.

Industry employees have altered or downgraded FAA safety directives.

Regional FAA offices responsible for monitoring aircraft structural integrity are denied accident or incident reports that may affect vital safety decisions.

The FAA has not sufficiently monitored manufacturers' bulletins for items that may affect safety of flight.

The FAA too often concurs in a manufacturer's "fix" of a problem part or system that ignores human limitations and favors low cost over safety.

One of the basic deficiencies in the present system of aircraft certification is the use of designated engineering representatives [DER's], by the FAA. These are persons selected by the agency to perform inspection functions and approve work performed by the aircraft manufacturer. They also pass on the adequacy of thousands of airworthiness and quality control inspections during the design, construction, and test phases that prepare a modern airliner for commercial use. The basic problem with this arrangement is that they are employees of the manufacturer, not the Federal Government. They are paid by the company that employs them, not the Government agency that is charged with carrying out the public trust. In essence, the regulated are regulating themselves.

That is the precise terminology used by Congressman Jack Brooks, when, as chairman of this subcommittee, he presided over 2 days of hearings in June 1973 on the very same subject of FAA certification of aircraft.

In particular, the subcommittee was examining FAA certification of light aircraft. I would call the attention of the subcommittee to Chairman Brooks' opening statement:

> Under existing practice, the FAA has delegated almost complete authority to light airplane manufacturers to design and produce this type of aircraft. While FAA ultimately certifies the design of a new model and also certifies the process by which it will be mass produced, it has all but turned over to the manufacturers complete authority to determine whether their designs and production procedures comply with FAA regulation.
>
> In essence, it appears the regulated are regulating themselves. Such a procedure is most unique and requires exceptionally critical oversight.

The disadvantages of such "self-certification" were clearly illustrated by the General Accounting Office in a report submitted to this subcommittee during its 1973 hearings.

Specifically, the GAO cited the following disadvantages in the FAA's use of designated engineering representatives in the certification of light aircraft:

The Government does not participate in testing the aircraft before production and therefore cannot influence aircraft design until after problems are reported on the aircraft in operation;

The manufacturer cannot act as a fully independent arm of the FAA in testing airworthiness because it is involved in producing and selling the aircraft for profit; and

A manufacturer may be reluctant to disclose fully its manufacturing and testing procedures because such disclosure may subject it to criticism and may affect its product liability.

The FAA's limited participation in development does not allow it to acquire early familiarity with the aircraft. Such familiarity would benefit later assessment of the aircraft.

While we recognize the FAA's use of the employees of aircraft manufacturers as designated engineering representatives is a savings to the taxpayers, we believe that this system has been abused in the past and will continue to be unless it is brought under surveillance. The FAA record clearly shows that the agency cannot be trusted to oversee the manufacturers and that improvements in the certification process are needed.

In the past 5 years, at least three congressional committees have scrutinized the FAA and the way it administers the certification process. I have already quoted from reports of this committee and the Committee on Interstate and Foreign Commerce. In June 1974, following its investigation of the Turkish Airlines DC–10 crash near Paris, the Aviation Subcommittee of the Senate Commerce Committee concluded:

> While we share the concern that the DC–10 enjoy a high reputation for safety and reliability, we believe it is more important to deal with safety defects in an open and above-board manner. If dealt with that way, then public confidence will be bolstered in the regulatory process and in the FAA, which the public is entitled to believe exists to insure the highest safety standards in air transportation. Actions taken behind closed doors or actions which are kept off the public record only serve to create an impression of the regulator being unduly influenced by those he regulates. The regulatory process, particularly where public safety is concerned, should be totally above any suspicion that the Government is comprising safety standards to accommodate industry. Confidence in Government in general will not be bolstered by governmental actions which give the appearance of succumbing to private interests.

What has been the result of these clear recommendations from Congress? The FAA still conducts its business with manufacturers behind closed doors. The agency still attempts to balance safety against short-term economic factors. It still allows manufacturers largely to regulate themselves without critical oversight from the agency.

What can be done?

Our solution is to open the certification process by allowing public participation in the process. Our belief is that allowing the public, through interested parties, to participate in certification of transport category aircraft will by itself put a stop to the abuses that have occurred and will occur again. The process must be opened to the extent that it considers and acts on information from the scientific, technical, and operational communities. Letting the sunshine in will force the FAA to consider safety issues in their own right and not as something to be compromised with aircraft and airline economics.

Frankly, Mr. Chairman, we are disappointed that the administration of President Jimmy Carter is unwilling to improve the certification process. We remember that President Carter strongly supported the Government in the Sunshine Act before he was elected, and we note that "open Government" has been one of the themes of his administration.

Congress has already set a fine example for the FAA by holding open markup sessions and having conference committees meet in public. In view of the pledges of President Carter and the examples of Congress, it is hard for us to understand why the FAA is so adamant in its refusal to consider change and open itself to public scrutiny.

We are grateful to your leadership and initiative in exploring this issue, Mr. Chairman. Today's hearing is very appropriate for this committee, which has a long and distinguished record in working for

more open Government through such legislation as the Freedom of Information Act and the Government in the Sunshine Act.

This closed certification process strikes directly at one of the basic concerns of airline pilots—safety. There have been many instances in the past where defects in the certification process and the reluctance of the FAA to regulate the manufacturers forcefully have led to accidents.

At your request, Mr. Chairman, we earlier furnished the subcommittee with four analyses of incidents where deficiencies in the certification process and the lethargy of the FAA have created safety hazards.

Today we are submitting five more cases that show breakdowns in the certification process. These nine cases are described in the material we are submitting today along with extensive technical documentation for the use of the subcommittee.

We are scrupulously refraining from sensationalism in these cases. We are seeking constructive change, not headlines.

These nine cases have the following common characteristics:

The details have been verified by independent investigators. A third party has no other way of penetrating the veil of secrecy that surrounds the certification except to rely on such outside surveys, which are almost always congressionally sponsored.

The weaknesses they reveal question the integrity of the underlying system and the FAA's administration of that system.

The corrective actions, if any, have treated the symptoms rather than the cause of the disease.

These studies share one further characteristic, which is that invariably, despite warnings from ALPA and others, the danger signals were ignored and the problems were not given serious attention until lives were lost.

A sense of complacency has again become widespread.

Generally, improving our historical safety trends or data create the assumption that "All's well. If it's not broken, don't fix it."

What is forgotten is today's mistakes usually do not show up until tomorrow's tragedies. Disasters such as Teneriffe also terribly demonstrate that the safety record can be ruined by a single accident.

Now is the moment for safety-oriented groups to speak out before more passengers and crewmembers are killed in needless, avoidable disasters.

Briefly, the first case, as you are aware, is the General Electric CF–6 jet engine, Mr. Chairman.

The FAA did not use the most current and highest standards in certificating this engine because the manufacturer claimed it would be at an economic disadvantage if the agency used such standards. In addition the FAA was slow to respond when operational experience revealed weaknesses in the CF–6's susceptibility to ice ingestion and bird strikes, and in design of the shroud.

Problems with the shroud and ice ingestion have now been solved, but the FAA has yet to develop standards that will enable the CF–6 and other large jet engines to withstand bird strikes. What such a strike can do to an aircraft was shown in November 1975 when a wide-bodied jet with CF–6 engines was taking off from Kennedy International Airport in New York. Sea gulls were sucked into one engine,

causing it to explode. The captain was able to stop the aircraft off the runway, and the 139 passengers got out safely. Fire destroyed the aircraft.

What particularly concerns us about the FAA's failure to develop the needed standards is that the number of bird strikes involving aircraft with large engines will go up in the future as more and more such aircraft enter airline service and begin flying short-haul routes that involve many more landings and takeoffs per day than long-haul ones.

The second case deals with wet runway standards. Today after 20 years of jet transport operations, the FAA still does not require aircraft to be tested on wet runways. Instead, the agency adds 15 percent to the dry runway stopping distance. However, tests in 1971 showed that some jet transports were still unable to stop within the certificated distance. When ALPA pointed out the obvious safety hazards, the FAA accused us of overstating the problem. That might be difficult. Within the last 2 years, two airliners have run off wet runways right here at National Airport. There was little publicity because no one was injured, but the difference between a minor incident and a major accident is often only a split second.

Mr. Chairman, we would like to at this time present a film showing a high-performance jet aircraft being demonstrated on wet runways, if we could.

Mr. BURTON. Without objection, we will turn out some lights and have the film.

[Movie shown.]

Captain O'DONNELL. The next issue we would like to bring up is the fail-passive automatic landing systems.

These are designed to allow aircraft to land in very bad weather, with a visibility of only 700 feet along the runway. Unlike other instances, in which the FAA has done to little too late, this time it is doing too little too soon regarding autoland systems. The agency is preparing to certificate fail-passive autoland systems as safe without adequate testing and with less stringent standards than the French used in their successful system. The heart of our concern is that the pilots will be asked to do many things manually in poor weather under the FAA's autoland system. Neither the agency nor the manufacturers have demonstrated that pilots will indeed be able to accomplish these tasks safely during the critical approach and landing phases of flight when crew workload is at its highest.

The next case regards collision avoidance systems. The FAA is still years away from certificating an operational collision avoidance system, or CAS, to prevent midair collisions, even though the technology has been available for many years. Hundreds of airline passengers have died in midair collisions in the past 20 years due to deficiencies in the present air traffic control system and its dependence on the "see-and-be-seen" principle.

It is unbelievable, Mr. Chairman, that this statement was completed 3 days ago—before yesterday's accident.

The FAA's own study, as reported in the September 4 issue of Aviation Week and Space Technology, looked at 15 midair collisions in the 1964–72 period. Those accidents killed 271 persons. The FAA

found that 13 of the 15 could have been prevented if one or both aircraft had a beacon-based collision avoidance system called B–CAS.

As if these were not enough, there are many more instances in the public record where deficiencies in the certification process led to accidents or inadequate safety standards.

The other five cases that we have discussed are the following:

First, the DC–10 cargo door. Failure of the door caused the crash of a Turkish Airlines DC–10 that killed 346 persons, the greatest single-plane disaster in history. The extensive record compiled by congressional investigations and court suits shows how the FAA relied on a "gentlemen's agreement" with the manufacturer to repair defects in the door, instead of issuing a mandatory directive that would have meant unfavorable publicity for McDonnell Douglas.

Second, the DC–8 ground spoilers. Two fatal accidents caused by accidental deployment of the spoilers in the air instead of on the ground killed 170 persons before the FAA issued a mandatory airworthiness directive [AD] requiring design changes to correct the problem. An earlier AD merely advised the pilots not to deploy the spoilers in the air. A House subcommittee called that directive "almost totally worthless" and said it did nothing more than warn pilots not to crash their aircraft.

Third, the ground proximity warning systems, or GPWS. These devices warn pilots when they are too close to the ground or are descending too rapidly. The National Transportation Safety Board recommended repeatedly that the FAA require GPWS on all airline aircraft. But it was not until after congressional hearings, and crashes killing several hundred, that the agency required the GPWS before an airliner could be certificated.

Fourth, the head-up display, or HUD. These devices project flight information to the pilot while he is looking through the windshield, thus obviating the need for him to keep moving his eyes from the instrument panel to outside and back again.

A HUD can significantly increase safety during the approach, the busiest and most critical portion of the flight. The military services and several European countries have operational HUD's. ALPA has been trying since 1966 to get the FAA to certificate HUD's, but the agency still says more research is needed.

However, we know of at least two incidents in which the FAA succumbed to objections from the airlines and stopped already-authorized development programs. If the FAA had continued these programs, it would have had the necessary criteria for certificating these displays. Now an aircraft manufacturer has asked for certification of a HUD, and the FAA does not know what standards to apply.

Fifth is the DC–9 stall warning. This very loud warning is designed to tell pilots that the aircraft is about to stall. The problem is that it sometimes sounds accidentally during critical moments of takeoff or landing and poses a real safety hazard by disrupting communication between pilots and distracting them. ALPA has been trying since 1972 to get the FAA to reduce the loudness of the stall warning, but the agency has refused. The hazard of this disruptive noise was shown in an accident in Northern Europe. A false stall warning sounded, and the DC–9 ran off the end of the runway and came to rest on a frozen

lake. The passengers got out safely before the aircraft sank through the ice. What would have happened if it had been summer?

Of these nine cases, six are still open; that is, the FAA has not moved efficiently to insure the highest standards of safety. This lethargy or carelessness on the part of our national aviation safety agency should be alarming to anyone concerned about safe flying. This record demonstrates that the FAA—regardless of the usual public proclamations on the primacy of safety—has not improved its inadequate performance in transport certification and apparently has no intention of doing so.

Indeed, Mr. Chairman, the more ALPA became involved with the FAA over the certification issue, the more we found Administrator Bond and his agency digging in their heels and refusing to consider possible improvements.

We consider this intransigence to be particularly scandalous in view of the clear mandate of the Federal Aviation Act. This basic law of U.S. aviation directs the Secretary of Transportation, and his subordinate, the FAA Administrator, to "exercise and perform his powers and duties under this act in such manner as will best tend to reduce or eliminate the possibility of, or recurrence of, accidents in air transportation * * *."

We believe that opening the certification process would be a needed spur to the FAA Administrator in increasing compliance with the law.

While we have grave doubts, Mr. Chairman, that the FAA will ever open the certification process on its own, let me respond to your request with some specific recommendations on modifying the current certification process.

The process could be improved by having the FAA hold public hearings at various stages of the certification process. These hearings would be announced in advance, and documentation compiled by the manufacturer, and the FAA would be available for public inspection. The hearings would enable those interested to review what the FAA and the manufacturers have done and to suggest improvements in the aircraft or the certification process before it is too late.

Generally, these public hearings would be held just before or in conjunction with meetings of the Type Certification Board, or TCB. The first hearing would be after the manufacturer has applied for a type certificate and just before the Preliminary TCB meets. This hearing is particularly important because the Preliminary TCB sets the framework and standards for the rest of the certification process.

Additional hearings would be held before meetings of the Interim TCB's and the Preflight TCB, and before the type inspection authority is issued. The last hearing would come before the Final TCB meets and issues the type certification.

This schedule of hearings probably would be enough to let the sunshine on the certification process. In addition, the FAA could establish a procedure under which an interested member of the public could petition the agency to hold additional hearings. The FAA would then have to hold the hearings or publicly state why it was denying the request.

We expect that those who want to keep doing business in the same old way, who object to strengthening the certification process, will oppose our suggestions for public hearings.

Administrator Bond has already rejected our request for public hearings. His reasons for rejecting ALPA's request are that:

A public hearing would enable foreign competitors of U.S. manufacturers to obtain proprietary information and thereby gain a competitive advantage;

Such hearings would impose an unreasonable administrative burden upon the FAA.

Regarding disclosure of proprietary information, our experience has been that there are few trade secrets involved in the manufacture of large commercial transports, particularly at the certification stage. Unlike military aircraft, commercial transports do not use classified technology. Commercial manufacturers do not take the risk of using secret, unproven technology in an aircraft designed to carry hundreds of passengers.

We recently received additional proof that what is labeled "proprietary information" is often not so. In response to an ALPA request under the Freedom of Information Act, the FAA at first refused to release certain documents relating to certification of an aircraft on the grounds that they contained "proprietary information." We eventually obtained these documents and found nothing proprietary about the information in them. We will gladly show these documents to the subcommittee so that you may see what the FAA and the manufacturer consider proprietary. Another question is what proprietary technical information there could be on an aircraft that was certificated 13 years ago.

I would like to show a chart, Mr. Chairman.

[Chart shown.]

Captain O'DONNELL. As an example of how the "proprietary information" can be used to keep embarrassing information from the public view, we offer this chart, Mr. Chairman.

It was presented by the FAA to NTSB during an investigation of the accident earlier this year when two tires on a Continental Airlines DC–10 blew out on takeoff at Los Angeles and the aircraft went off the wet runway. The "data deleted" refers to the stopping performance of the DC–10. The information in this chart is at least 7 years old, and we question why FAA and McDonnell Douglas are unwilling to release it.

The question of whether information is indeed proprietary is too sensitive to be left to the FAA's judgment. Therefore, we propose that an independent agency such as the General Accounting Office or the National Transportation Safety Board should review any data claimed to be proprietary and decide whether they are indeed so.

It is highly unlikely that a rival manufacturer would spend the time and money to copy an aircraft being certificated. A modern commercial transport is not like a transistor radio that can be easily and cheaply copied.

Finally, we point out that the three U.S. manufacturers are considering a number of joint aircraft production programs with a variety of companies in Europe and Japan. It does not appear that the U.S. companies fear the loss of proprietary information.

Regarding the administrative burden, it is hard to see how it would be onerous for the FAA. Since 1970, the agency has certificated just

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four aircraft in the wide-bodied transport category. ALPA is not suggesting a continuous public hearing throughout the months of certification; we are asking for hearings at well-defined points in the already-established process.

We note that the Federal Aviation Act, section 603(a)(2), already authorizes the Secretary of Transportation to hold hearings on applications for type certificates. We find it strange that the FAA is so reluctant to hold hearings that Congress has already authorized it to conduct.

During our lengthy efforts to open the certification process, Mr. Chairman, we have come reluctantly to the growing conviction that the FAA is resisting us not on the merits but because it has something to hide. We suspect the real reason the agency does not want public scrutiny of certification is fear of what it would reveal about the FAA's performance and its relationships with manufacturers.

We think the public would be outraged to learn that the FAA allows the industry to engage in self-regulation.

We think the public would be outraged to learn that the FAA does little more than rubberstamp what the manufacturer does.

We think the public would be outraged to learn that the FAA doesn't require safety improvements because it might place a manufacturer at a competitive disadvantage.

We think the public would be outraged to learn that the FAA refuses to require needed safety equipment because it will increase the cost of aircraft to a commercial airline.

Let us not be misled by Mr. Bond's proprietary data protestations. The FAA's aircraft certification process is a sham, and it must be changed.

Decisions are the prime stock in trade of pilots. The quality of any decision is a direct reflection on the quality of information upon which it is based. What we find inexcusable are the known hazards with known solutions that go uncorrected.

Our efforts to open the certification process, Mr. Chairman, are an inherent part of our long-standing and deep commitment to aviation safety.

Pilots have long recognized their responsibility when it comes to sounding the alarm for safety. The Air Line Pilots Association was founded on the theme of "Schedule with Safety," which means we intend to meet our schedules but only if we are assured that we can do so with the highest degree of safety for our passengers, our aircraft, and ourselves.

It is for that basic reason that we have developed an expertise within the organization to assess aeronautical developments and determine for ourselves whether the highest degree of safety is maintained in current aircraft and is made available in new aircraft. ALPA has developed one of the largest independent flight safety organizations in the world, and we spend several million dollars each year on our aviation safety activities. We know what is possible and obtainable within the state of the aeronautical and electronic arts. We firmly believe that our passengers deserve no less than the best equipment and practices that industry can produce.

Mr. Chairman, we are grateful for your initiative in holding this needed hearing, and we appreciate your giving us this opportunity to present our views on the subject of aircraft certification.

We believe that once the members of this subcommittee examine the issue, they will come to the same conclusions that all other congressional committees have come to—that the FAA certification process is sorely in need of improvement.

In addition to assuring that the certification process be improved and opened, Mr. Chairman, we strongly urge the Congress to consider legislation that would amend the Federal Aviation Act to remove the mandate of the Secretary of Transportation to promote aviation and leave him free to concentrate on insuring high standards of safety.

We now look to you, Mr. Chairman, and the members of the subcommittee for any assistance you can contribute to improve the aircraft certification process, thereby making a major contribution toward attaining the highest level of aviation safety.

Mr. Chairman, we thank you very much. We are prepared to answer any questions you may have.

Mr. BURTON. Thank you.

At this point, without objection, we will insert the material regarding the nine analyses you submitted to the committee for the record. It will be helpful to us.

[The material referred to follows: and the supporting documentation has been supplied for the subcommittee files.]

AIR LINE PILOTS ASSOCIATION
1625 MASSACHUSETTS AVENUE, N.W. □ WASHINGTON, D.C. 20036 □ (202) 797-4000

September 13, 1978

The Honorable John Burton
Chairman, Subcommittee on
Government Activities and Transportation
Committee on Government Operations
U. S. House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

In response to your request of August 16, I am submitting four written analyses of instances where the Federal Aviation Administration's handling of the aircraft certification process has created aviation safety hazards. These analyses are enclosed with this letter.

Briefly, they cover:

-- The General Electric CF-6 jet engine. The FAA did not use the most current and highest standards in certificating this engine because the manufacturer claimed it would be at an economic disadvantage if the agency used such standards. In addition, the FAA was slow to respond when operational experience revealed weaknesses in the CF-6's susceptibility to ice and bird strikes.

-- Wet runway standards. The FAA has ignored ALPA requests to include aircraft performance on wet runways as well as dry ones in the certification process. The mathematical arrangement now used by the FAA creates safety hazards by not accurately reflecting how aircraft perform on wet runways.

-- Automatic landing systems. The FAA is preparing to allow airline transports to land in very poor weather (visibility of only 700 ft. along the runway) based on inadequate testing and a misinterpretation of the French experience. It has rejected ALPA protests that its proposed standards are inadequate.

-- Collision avoidance systems. The FAA is still years away from developing an operational collision avoidance system (CAS) to prevent midair collisions even though the technology has been available for many years.

When I testify, I will present proposals for improving the aircraft certification process. ALPA believes these will lead to higher standards and a reduction in the bureaucratic intransigence and lethargy that has too often characterized the FAA. The final result will be higher levels of safety for the millions of Americans who fly.

On behalf of the 30,000 members of ALPA, I thank you for conducting this needed and independent review of the aircraft certification process. We will continue to cooperate with you any way we can in the worthwhile goal of improving aviation safety.

Sincerely,

J. J. O'Donnell, President

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Enclosures

GENERAL ELECTRIC CF-6 ENGINE

This case involves insufficient testing of a new jet engine by the manufacturer and the Federal Aviation Administration and the failure of the FAA to apply the most current certification standards. These lapses led to at least three incidents of engine failure in passenger-carrying DC-10s. The FAA's response to this evidence of a weakness in the engine was half-hearted. Only after another engine failure -- in which a DC-10 valued at about $30 million was destroyed--did the Agency require changes to the engine itself to prevent future failures.

The problem with the CF-6 involved the compressor blades in the front of the engine. These blades rotate thousands of times each minute at near supersonic speed. They must be able to withstand ice, birds or other objects that are occasionally drawn into the engine. Otherwise, the blades will break and hurl metal fragments through the engine and into the wing or fuselage.

The CF-6 used compressor blades with holes drilled into the tips to save weight. However, these drilled-tip blades proved unable to withstand the impact of birds or ice drawn into engine intakes. Evidence accumulated by a special investigation subcommittee of the House Interstate and Foreign Commerce Committee revealed a critical breakdown in the airworthiness certification process as administered by the FAA.

In January of 1970, the FAA certificated the CF-6 engine as "safe". Despite the fact it was a "new technology" engine which advanced the state of the art by several stages, five-year-old and, as it turned out -- unsatisfactory -- certification standards were applied to the engine under the "special conditions" authority vested in the FAA. Special conditions basically allow manufacturers to set their own certification standards if they can provide to FAA a satisfactory design and engineering

basis for an exception to existing rules.

This was done for the CF-6 engine.

The company sought special conditions for certification of its new engine with drilled-tip blades, which had never been used before, based on the FAA's earlier certification of the Pratt & Whitney JT9D engine, which powers most Boeing 747s. The JT9D was the first high-bypass-ratio engine to enter commercial service. It and the CF-6 engine use advanced technology to produce about three times more power than earlier engines on such aircraft as the 727 and DC-9.

When certification of the JT9D was requested, the FAA did not have certification standards for high-bypass-ratio engines. Therefore, the JT9D was certificated in accordance with an Advisory Circular (AC) covering older, less powerful engines. A new AC for high-bypass-ratio engines were being written when General Electric requested certification of the CF-6. The company argued successfully that it would be an economic hardship if the FAA were to apply the new AC to its engine when it had not been applied to the earlier JT9D. Of course, the certification criteria in the new AC could not have been applied to the JT9D because they had not yet been formulated.

Thus, the FAA bowed to the manufacturer's economic arguments and did not employ the most current and stringent technical standards when it certificated the CF-6.

The House subcommittee report noted three accidents over a 14-month span of CF-6 operation during which ample evidence of difficulties with drilled-tip compressor blades was gathered. Despite these findings, however, the FAA declined to issue an Airworthiness Directive (AD) to replace drilled-tip blades with those of more conventional manufacture.

General Electric switched to solid-tip compressor blades in all its production

engines, including the CF-6, in December, 1973. This did not, of course, solve the problem of several dozens of CF-6 engines with drilled tips already in service. The Air Transport Association, an airline trade association, according to the subcommittee report, estimated that it would cost $47,000,000 to convert drilled-tip CF-6's to solid tips, and opposed an Airworthiness Directive which would have mandated the conversion.

The House subcommittee investigation also disclosed that icing tests made by the Great Lakes Region of the FAA were nowhere near what could be described as exhaustive. In fact, the subcommittee report declared that test aircraft did not penetrate known icing conditions for any length of time at all in certification tests. Even at lesser icing conditions, test engines suffered damage. Nevertheless, certification proceeded.

FAA did issue an Airworthiness Directive (AD) on the CF-6. The AD, however, did not call for a fix of the engine. Rather, it called for protection of fuel lines and other control conduits on the DC-10, particularly to the No. 2, or tail-mounted engine.

That AD, issued August 23, 1974, provided only that the main fuel line to the tail engine of the DC-10 be shielded on GE-powered aircraft. Less than two months later, on October 15, the original AD was amended to provide that special shielding was necessary only on GE-powered DC-10's with drilled-tip compressor blades.

On November 12, 1975, an Overseas National Airways DC-10 began its takeoff roll at John F. Kennedy Airport. Midway down the runway, the DC-10 encountered a flock of gulls feeding from a nearby garbage dump. One of the plane's wing-mounted engines -- not the high, tail-mounted engine that was the subject of the FAA's two airworthiness directives -- ingested some of the flock. Its drilled tip blades disintegrated into shrapnel that blasted through the engine shroud and into the

wing and fuselage. Portions of the disintegrating engine ripped through fuel lines causing jet fuel to ignite. The pilot ultimately fought the blazing aircraft to a halt off the end of the runway. His actions allowed the 139 passengers to escape, but the DC-10 was consumed by fire.

As a result of the ONA DC-10 accident at JFK, the NTSB held two public hearings. One of these hearings delt specifically with the CF-6 engine -- the engine certification requirements, type of engine failure, etc.

After the hearings, the NTSB determined that the probable cause of this accident was, "the disintegration and subsequent fire in the Number 3 engine when it ingested a large number of sea gulls". A contributory factor to the accident according to the NTSB was, "the Federal Aviation Administration and the General Electric Company failed to consider the effects of rotor imbalance on the abradable epoxy shroud material when the engine was tested for certification".

The NTSB then issued the following recommendations concerning the CF-6 engine:

"1. Require immediate retest of the General Electric CF-6 engine to demonstrate its compliance with the complete bird ingestion criteria of AC 33-1A (Class I - Urgent followup.) (A-76-59).

"2. Require that any engine modifications necessary to comply with the bird ingestion criteria of AC 33-1A be incorporated into all newly manufactured CF-6 engines. (Class II - Priority followup.) (A-76-60).

"3. Require that any engine modifications necessary to comply with the bird ingestion criteria of AC 33-1A be incorporated into all CF-6 engines in service. (Class II - Priority followup). (A-76-61).

"4. Until the CF-6 engine is modified, require that a bird patrol sweep runways at all airports which have recognized bird problems and are served by CF-6 powered aircraft. The sweep should be made before a runway is put into operation for CF-6 powered aircraft and at sufficient intervals thereafter to assure that a bird hazard does not exist. (Class I - Urgent followup). (A-76-62).

"5. Advise all operators, domestic and foreign, of CF-6 engines of the catastrophic consequences of foreign objects damage and the need for appropriate caution to avoid such damage. (Class I - Urgent followup). (A-76-63).

"6. Amend 14 CFR 33.77 to increase the maximum number of birds in the various size categories required to be ingested into turbine engines with large inlets. These increased numbers and sizes should be consistent with the birds ingested during service experience of these engines. (Class III - Longer Term followup.) (A-76-64).

The FAA then issued an Airworthiness Directive (AD) requiring a modification to the engine shroud. This AD also required a retrofit for the shroud on existing engines.

The FAA has not yet acted on the last recommendation of the NTSB. Action was withheld pending an Engine Review the agency conducted last year. Results of that Review have not yet been made public.

Of the CF-6 episode, the House subcommittee commented:

" ...when the FAA is engaging it its critical function of certificating an engine or an aircraft, it must resolve any doubts on the side of caution. It did not do that in this (CF-6) instance. The CF-6 engine had drilled turbofan blades and a different anti-icing capability than previous engines. The FAA should have required simulated flight testing before certificating the engine. Moreover, when damage to the engines occurred during the icing flight tests of the aircraft, additional testing under comparable conditions should have been required of the manufacturer."

The subcommittee concluded:

"When the engine and later the aircraft (DC-10 with GE engines) encountered certification difficulties, the respective manufacturers of each descended on the FAA to forestall further testing and to expedite the certification process. This can no doubt be expected, but the FAA must resist any such pressures to shortcut its procedures. There can be no accommodation when considerations of safety must be paramount(emphasis added)."

WET RUNWAY PERFORMANCE

Current certification standards require that aircraft be tested only on dry runways. This failure of the Federal Aviation Administration to require testing under such a common operating condition as a wet runway has been directly responsible for many accidents and incidents. Modern airliners weigh as much as 300 tons and are traveling at about 150 mph. when they land. Clearly, whether the runway is wet or dry will have a major effect on how much distance the aircraft will need to stop safely because aircraft perform far differently on wet runways than on dry ones.

For example, many transport aircraft have spoilers -- devices on the top of the wing that pop up after landing to "spoil" the lift of the wing and thereby keep the aircraft on the ground and shorten the stopping distance. These spoilers are usually deployed automatically as soon as the aircraft wheels start going around. That works well on dry runways but not so well on wet ones. On runways with a thin layer of water on top, the aircraft wheels often skim across the top of the water and do not touch the hard surface underneath. This phenomenon is called hydroplaning. In addition to making the aircraft brakes ineffective, hydroplaning also causes the spoilers not to deploy automatically because the wheels are not turning. The pilots can deploy the spoilers manually, but that takes time. During that time, the aircraft is traveling hundreds of feet down the runway.

The adverse impact that wet runways have on aircraft performance and therefore on safety means that wet-runway performance should be included in the certification process. ALPA has recommended that several times in the past. In 1973, we told the FAA that its Flight Test Handbook, which tells manufacturers how to test their aircraft for certification, should include testing on

wet runways. When the Handbook appeared, however, it contained no mention of wet-runway testing. In 1974, we recommended to the FAA's Airworthiness Review a proposed rule covering aircraft performance on wet runways. So far, we have heard nothing; the FAA has neither acted on nor rejected our proposed rule.

The distance for landing on a dry runway as determined by the FAA through testing includes an allowance for such operational variables as landing long, i. e., farther down the runway than usual, and landing faster than usual. However, the experience built up over the years by airline pilots clearly shows that this allowance is insufficient when the runway is wet.

But the FAA has not required additional testing to determine scientifically what the wet runway stopping distance should be. Instead, it has glossed over this deficiency in the certification process by adding an arbitrary 15 per cent to the dry runway stopping distance to arrive at the wet runway distance.

There are two serious flaws in this procedure. First, the FAA does not define what a wet runway is. Second, the agency allows the manufacturer to demonstrate shorter landing distances than required by the 15 per cent rule. Such a provision can be almost meaningless if there is no definition of a wet runway.

That is graphically illustrated by the Boeing 727. The company was able to convince the FAA that the 727 required only 7 - 8 per cent more to stop on a wet runway instead of the agency's estimate of 15 per cent, and the aircraft was certificated for the shorter distance.

However, later tests by the FAA and the National Aeronautics and Space Administration showed that the 727 on a truly wet runway far exceeded even the 15 per cent margin. In some cases, the aircraft took about twice the dry-runway distance to stop on a wet runway. The reason is that brake application just after touchdown caused the wheels to lock. That in turn induced extensive hydroplaning, which led to the excessive runway stopping distances.

The lack of wet runway standards in the certification process has resulted in pilots developing their own techniques to cope with the problem. There have been many incidents and accidents stemming from hydroplaning; that there have not been more is a tribute to the skill and experience of airline pilots, not to the FAA's certification procedures.

AUTOLAND SYSTEMS

In August, 1975, the Federal Aviation Administration announced its intention to establish requirements for airline operation landings in very bad weather for the Boeing 727 and other aircraft such as the Boeing 737 and the McDonnell Douglas DC-9 that have automatic landing (autoland) systems installed. The new weather minimum criteria (Category 3A) were visibility along the runway (RVR) of 700 feet, and a decision height of 50 feet. (Decision height (DH) is the height above the ground at which the pilot either must see the runway ahead or end the approach and climb.)

As justification for its decision, the FAA cited the following:

-- The French have successfully conducted such operations.

-- Boeing has completed all Category 3 requirements for the 727 autoland system.

-- The feasibility of conducting operations to such low weather minima was discussed at an industry meeting in August, 1973.

-- The FAA conducted a series of autoland approaches with a 727 in January, 1974.

-- Additional tests were run at the FAA's National Aviation Facilities Experimental Center (NAFEC) in April and July, 1974.

ALPA has undertaken its own lengthy investigation of the FAA's justification. What we learned makes us question whether the FAA's proposal will provide an adequate margin of safety. Our specific reservations follow:

French Experience. The French operations have many mandatory aspects that are not found in the FAA proposal. Among the many examples are use of automatic throttles, automatic landing controls, more stringent crew qualifications, more detailed crew procedures and a three-man cockpit crew even though the airplane is normally flown with only two pilots. ALPA believes that the French procedures

should be mandatory in the FAA proposal if full safety is to be assured.

Boeing Data. ALPA has questions about some of the assumptions underlying the Boeing data. Included in these assumptions are that:

-- All go-around attempts following a failure in the autoland system will be successful because the failure will leave the aircraft in a position that assures a successful go-around.

-- Runway visual range (RVR) of 700 feet is assumed to be adequate, according to Boeing, because that is the figure the FAA uses. The FAA says that the 700 foot distance is based on Boeing data.

-- Conventional cockpit instruments are adequate to monitor the autoland system during the critical phases of approach and landing.

-- The ground portion of the instrument landing system (ILS) is 100 percent reliable.

ALPA believes that a complete, scientific certification program is needed to answer the serious questions raised by these unstated assumptions in the Boeing data.

Industry Meeting. The transcript of the August, 1973 meeting, which had representatives from virtually every segment of the airline industry, shows there was a strong consensus that:

-- Fail-passive autoland systems should not be authorized for operating to minima lower than Category 2 unless the total system reliability for such operations would be on the order of 10^{-9}.

-- Establishment of the reliability would need to be demonstrated by an adequate program of test and analysis.

-- This test and analysis program would necessarily consider, among other factors, the frequency of missed approach initiation at and below decision height and the risk associated with executing a missed approach at these altitudes.

-- Criteria for fail-passive autoland operations below Category 2 limits should include consideration of aircraft geometry and pilot eye height and should require independent go-around guidance.

Flight Demonstrations. The FAA conducted 20 automatic landings at Oklahoma City. The data given to ALPA on these tests consisted of two pages: one a memo and the other a tabulation of the flights. The memo says that the RVR on the 20 flights varied from 1,000 feet to 2,200 feet. The tabulation covers only the first 14 flights and shows RVR's of 1,000 to 3,000 feet. The memo and the tabulation thus do not agree. In any event, the FAA has not tested the autoland system at the RVR of 700 feet that it proposes to allow for airline operations. Current Category 2 operations permit RVRs as short as 1,200 feet.

NAFEC Tests. The script for the tests called for 49 anomalies in the ILS localizer and glide slope to be introduced during the tests. Only seven were actually introduced, and none of these involved the glide slope, which provides guidance on the proper angle of descent during approach. In nine of the 44 attempted autolandings, the pilot disconnected the autoland system because he considered the aircraft sink rate, drift rate or position to be unacceptable. Thus, the pilot took over in more than 20 percent of the approaches in good weather. Clearly, the capability of the pilots to take control of the aircraft under the poor weather of Category 3 is important and needs to be established. ALPA has found no evidence that the FAA has done so.

In the latest response to ALPA, in January of this year, the FAA said it has "serious doubts as to whether continuing this long-standing series of correspondence can serve any useful purpose since substantial amounts of time in both your organization and ours are being devoted to unproductive correspondence on this subject. No new information has been forthcoming, and much of our effort, which needs to be devoted to

bona fide safety questions, is being diverted unnecessarily."

Rather than go away quietly, as the FAA clearly would prefer, ALPA will continue to push for higher standards of safety in commercial aviation.

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COLLISION AVOIDANCE SYSTEMS

These are designed to give ample warning to a pilot of an impending midair collision. The need for a CAS was demonstrated in the late 1950's and early 1960's when there were several midair collisions between scheduled airliners resulting in the deaths of several hundred persons. More recently, the problem of midair collisions has been complicated by the fact that most such tragedies involve airline transports and smaller general aviation aircraft or civilian and military airplanes.

ALPA has been calling on the FAA for many years to develop and certificate for airline use an effective CAS. We have not favored any one technology; there are several that could accomplish the mission. However, we have maintained that any CAS should be installed in the aircraft to give the pilot direct, immediate knowledge of any impending threat. The FAA, on the other hand, has favored a system that would rely on computers on the ground to detect a possible collision and transmit a warning to the aircraft. In addition to taking responsibility away from the pilot, the system proposed by the FAA would not provide protection over the oceans, particularly the North Atlantic with its heavy aircraft traffic, and on airport runways.

As far back as early 1972, ALPA was critical of the FAA for showing a lack of urgency in developing equipment that will enable the pilot to know when a midair collision is imminent. Early last year, the FAA told the Senate aviation subcommittee it intended to pursue an airborne system known as the beacon collision avoidance system (BCAS) and would have a national standard by June, 1977. At about the same time, ALPA called on the FAA to push development of BCAS and presented a list of minimal technical and operational criteria.

In June of last year, ALPA pointed out the BCAS is compatible with the FAA's ground-based system known as the discrete address beacon system (DABS). Therefore, it should not be considered an interim system to be used only until DABS becomes operational. Earlier this month the FAA indicated it will issue a draft national standard for a basic BCAS by the end of this year. Under the normal development schedule, the first equipment for airplanes would be available in 1982.

This BCAS, however, cannot be used in heavy-traffic areas. It will not be mandatory to install it in airline transports; thus there is no requirement for an airline to buy it. In the meantime, the FAA says it will begin to develop a concept for a more-capable BCAS that can be used in heavy traffic areas.

However, the recent experience of airline pilots has clearly shown that the greatest danger of midair collisions occurs not at the large and busy airports but at the more numerous smaller ones. There is a mix of airline transports flying under control from the ground and smaller private aircraft that frequently fly without such control at the smaller airports. This mix of controlled and uncontrolled aircraft is not found at the large airports.

The airline aircraft and the uncontrolled ones come close together near the airport. It is there, during approach and landing and during takeoff and climb out, that the workload of the airline flight crew is at its peak. Thus, the pilots have little time to spend looking out the window for small aircraft and therefore would benefit greatly from having an effective CAS in the cockpit.

The environment in which the aircraft is to be operated is an element that needs to be considered in the certification process. Clearly, the FAA has not considered the operational environment; if it had done so, it would have moved far more effectively to develop and certificate a CAS. As it now stands, we are no closer to developing and certificating an effective operational collision avoidance system than we were five years ago.

ATTACHMENTS TO THE STATEMENT OF

JOHN J. O'DONNELL, PRESIDENT

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE

SUBCOMMITTEE ON GOVERNMENT ACTIVITIES AND TRANSPORTATION

OF THE

COMMITTEE ON GOVERNMENT OPERATIONS

U. S. HOUSE OF REPRESENTATIVES

SEPTEMBER 26, 1978

CERTIFICATION OF AIRLINE TRANSPORTS

1. General Electric CF-6 Engine
2. Wet Runway Performance
3. Automatic Landing Systems
4. Collision Avoidance Systems
5. DC-10 Cargo Door
6. DC-8 Ground Spoilers
7. Ground Proximity Warning Systems
8. Head-Up Display
9. DC-9 Stall Warning Horn

ATTACHMENT 1

GENERAL ELECTRIC CF-6 ENGINE

This case involves insufficient testing of a new jet engine by the manufacturer and the Federal Aviation Administration and the failure of the FAA to apply adequate certification standards. These lapses led to at least three incidents of engine failure in passenger-carrying DC-10s. The FAA's response to this evidence of a weakness in the engine was half-hearted. Only after another engine failure - in which a DC-10 valued at about $30 million was destroyed - did the agency require changes to the engine itself to prevent future failures.

The CF-6 fan blades in the front of the engine rotate thousands of times each minute at near supersonic speed. They must be able to withstand ice, birds or other objects that are occasionally drawn into the engine. Otherwise, the blades will break and hurl metal fragments through the engine and into the wing or fuselage.

Three important problems were revealed by the early service experience:

- Fan blades with holes drilled in the tips to save weight had a tendency to break up into fragments when struck by birds, ice or other foreign objects. These blades are still allowed in service, but when used in the No. 2 (tail-mounted) engine of the DC-10, a special armor is required to protect fuel lines against damage from blade fragments.

- The fan blades seemed susceptible to damage from bird ingestion. No remedy has been applied to the problem and proposals for modifying the bird ingestion testing requirements of FAR 33 are included in the FAA's Engine Regulatory Review Program.

- The epoxy material used for shrouding the blades could be abraded into particles fine enough to explode in the engines. The remedy was to require replacement of the epoxy material with aluminum honeycomb.

Evidence accumulated by a special investigations subcommittee of the House Interstate and Foreign Commerce Committee revealed a critical breakdown in the airworthiness certification process as administered by the FAA.

In January of 1970, the FAA certificated the CF-6 engine as "safe." Despite

the fact the engine had new technology that advanced the state-of-the-art by several stages, a five-year-old and, as it turned out - unsatisfactory - certification standard was applied to the engine under the "special conditions" authority vested in the FAA. Special conditions basically allow manufacturers to set their own certification standards if they can provide to FAA a satisfactory design and engineering basis for an exception to existing rules.

This was done for the CF-6 engine.

The company sought special conditions for certification of its new engine with drilled-tip blades, which had never been used before, based on the FAA's earlier certification of the Pratt & Whitney JT9D engine, which powers most Boeing 747s. The JT9D was the first high-bypass-ratio engine to enter commercial service. It and the CF-6 engine use advanced technology to produce about three times more power than earlier engines on such aircraft as the 727 and DC-9.

The JT9D was gaining service experience during the time period of the CF-6 certification program. Service difficulties on the new engine were known to FAA engineers; however, it is not known whether, or to what extent, that information was used to modify or add emphasis to parts of the CF-6 testing.

When certification of the JT9D was requested, the FAA did not have certification standards for high-bypass-ratio engines. Therefore, the JT9D was certificated in accordance with Advisory Circulars (ACs) covering older, less-powerful engines. A new AC for high-bypass-ratio engine testing was being written when General Electric requested certification of the CF-6. The company argued successfully that it would be an economic hardship if the FAA were to apply the new AC to its engine when it had not been applied to the earlier JT9D. Of course, the certification criteria in the new AC could not have been applied to the JT9D because they had not yet been formulated.

Thus, the FAA bowed to the manufacturer's economic arguments and did not employ the most current and stringent technical standards when it certificated the CF-6.

The House subcommittee report noted three accidents over a 14-month span of CF-6 operation during which ample evidence of difficulties with drilled-tip compressor blades was gathered. Despite these findings, however, the FAA declined to issue an Airworthiness Directive (AD) to replace drilled-tip blades with those of more conventional manufacture.

General Electric switched to solid-tip compressor blades in all its production engines, including the CF-6, in December, 1973. This did not, of course, solve the problem of several hundred CF-6 engines with drilled tips already in service. The Air Transport Association, an airline trade association, according to the subcommittee report, estimated that it would cost $47,000,000 to convert drilled-tip CF-6's to solid tips, and opposed an Airworthiness Directive which would have mandated the conversion.

The House subcommittee investigation also disclosed that icing tests made by the Great Lakes Region of the FAA were nowhere near what could be described as exhaustive. In fact, the subcommittee report declared that test aircraft did not penetrate known icing conditions for any length of time at all in certification tests. Even at lesser icing conditions, test engines suffered damage. Nevertheless, certification proceeded.

FAA did issue an Airworthiness Directive (AD) on the CF-6. The AD, however, did not call for a fix of the engine. Rather, it called for protection of fuel lines and other control conduits on the DC-10, particularly to the No. 2, or tail-mounted engine.

That AD, issued August 23, 1974, provided only that the main fuel line to the tail engine of the DC-10 be shielded on GE-powered aircraft. Less than two months later, on October 15, the original AD was amended to provide special shielding was necessary only on GE-powered DC-10's with drilled-tip compressor blades.

On November 12, 1975, an Overseas National Airways DC-10 began its takeoff roll at John F. Kennedy Airport. Midway down the runway, the DC-10 encountered a flock of gulls feeding from a nearby garbage dump. One of the plane's wing-mounted engines -

not the high, tail-mounted engine that was the subject of the FAA's two airworthiness directives - ingested some of the flock. Its drilled-tip blades disintegrated into shrapnel that blasted through the engine shroud and into the wing and fuselage. Portions of the disintegrating engine ripped through fuel lines causing jet fuel to ignite. The pilot ultimately fought the blazing aircraft to a halt off the end of the runway. His actions allowed the 139 passengers to escape, but the DC-10 was consumed by fire.

As a result of the ONA DC-10 accident at JFK, the NTSB held two public hearings. One of these hearings dealt specifically with the CF-6 engine - the engine certification requirements, type of engine failure, etc.

After the hearings, the NTSB determined that the probable cause of this accident was, "the disintegration and subsequent fire in the No. 3 engine when it ingested a large number of sea gulls." A contributory factor to the accident according to the NTSB was, "the Federal Aviation Administration and the General Electric Company failed to consider the effects of rotor imbalance on the abradable epoxy shroud material when the engine was tested for certification."

The FAA then issued an Airworthiness Directive (AD) requiring a modification to the engine shroud. This AD also required a retrofit for the shroud on existing engines.

Among the six recommendations the NTSB issued on the CF-6 engine were that the FAA "increase the maximum number of birds in the various size categories required to be ingested into turbine engines with large inlets. These increased numbers and sizes should be consistent with the birds ingested during service experience of these engines."

The FAA has not yet acted on the last recommendation of the NTSB. Action was withheld pending the agency's Engine Regulatory Review Program. Results of that program have not yet been made public.

Of the CF-6 episode, the House subcommittee commented:

> ". . .when the FAA is engaging in its critical function of certificating an engine or an aircraft, it must resolve any doubts on the side of caution. It did not do that in this instance. The CF-6 engine had drilled turbofan blades and a different anti-icing capability than previous engines. The

FAA should have required simulated flight testing before certificating the engine. Moreover, when damage to the engines occurred during the icing flight tests of the aircraft, additional testing under comparable conditions should have been required of the manufacturer."

The subcommittee concluded:

"When the engine and later the aircraft (the DC-10) encountered certification difficulties, the respective manufacturers of each descended on the FAA to forestall further testing and to expedite the certification process. This can no doubt be expected, but the FAA must resist any such pressures to shortcut its procedures. There can be no accommodation when considerations of safety must be paramount." (Emphasis added)

ATTACHMENT 2

WET RUNWAY PERFORMANCE

Current certification standards require that aircraft be tested only on dry runways. This failure of the Federal Aviation Administration to require testing under such a common operating condition as a wet runway has been directly responsible for many accidents and incidents. There were 21 accidents in the 1967-1977 period, and there are about 30 incidents each year involving wet runways. Modern airliners weigh as much as 300 tons and are traveling at about 150 m.p.h. when they land. Clearly, whether the runway is wet or dry will have a major effect on how much distance the aircraft will need to stop safely because aircraft perform far differently on wet runways than on dry ones.

For example, many transport aircraft have spoilers -- devices on the top of the wing that pop up after landing to "spoil" the lift of the wing and thereby keep the aircraft on the ground and shorten the stopping distance. These spoilers are usually deployed automatically as soon as the aircraft wheels start going around. That works well on dry runways but not so well on wet ones.

On runways with a thin layer of water on top, the aircraft wheels often skim across the top of the water and do not touch the hard surface underneath. This phenomenon is called hydroplaning. In addition to making the aircraft brakes ineffective, hydroplaning also causes the spoilers not to deploy automatically because the wheels are not turning. The pilots can deploy the spoilers manually, but that takes time. During that time, the aircraft is traveling hundreds of feet down the runway.

It must be remembered that approach and landing is one of the highest periods of crew workload. There are many manual and mental tasks to perform during touchdown. Any additional tasks, mental or manual, placed on the pilot

by the failure of an automatic system can only be a detriment to safety.

The adverse impact that wet runways have on aircraft performance and therefore on safety means that wet-runway performance should be included in the certification process. ALPA has recommended that several times in the past 15 years. For example,in 1973, we told the FAA that its Flight Test Handbook, which tells manufacturers how to test their aircraft for certification, should include testing on wet runways. When the Handbook appeared, however, it contained no mention of wet-runway testing. In 1974, we recommended to the FAA's Airworthiness Review a proposed rule covering aircraft performance on wet runways. So far, we have heard nothing; the FAA has neither acted on nor rejected our proposed rule.

The distance for landing on a dry runway as determined by the FAA through testing includes an allowance for such operational variables as landing long, i. e., farther down the runway than usual, and landing faster than usual. However, the experience built up over the years by airline pilots clearly shows that this allowance is insufficient when the runway is wet.

But the FAA has not required additional testing to determine scientifically what the wet runway stopping distance should be. Instead, it has glossed over this deficiency in the certification process by adding an arbitrary 15 per cent to the dry runway stopping distance to arrive at the wet runway distance.

There are two serious flaws in this procedure. First, the FAA does not define what a wet runway is. Second, the agency allows the manufacturer to demonstrate shorter landing distances than required by the 15 per cent rule. Such a provision can be almost meaningless if there is no definition of a wet runway.

That is graphically illustrated by the Boeing 727. The company was able to convince the FAA that the 727 required only 7 - 8 per cent more to stop on a wet runway instead of the agency's estimate of 15 per cent, and the aircraft

was allowed to use the shorter distance.

However, later tests by the FAA and the National Aeronautics and Space Administration showed that the 727 on a truly wet runway far exceeded even the 15 per cent margin. In some cases, the aircraft took about twice the dry-runway distance to stop on a wet runway. The reason is that brake application just after touchdown caused the wheels to lock. That in turn induced extensive hydroplaning, which led to the excessive runway stopping distances.

The lack of wet runway standards in the certification process has resulted in pilots developing their own techniques to cope with the problem. There have been many incidents and accidents stemming from hydroplaning; that there have not been more is a tribute to the skill and experience of airline pilots, not to the FAA's certification procedures.

ATTACHMENT 3

AUTOMATIC LANDING SYSTEMS

Equipment and techniques that would enable airliners to land automatically in very bad weather have been under development since 1959. At that time, the ceiling, or the bottom of the clouds, had to be at least 300 feet above the ground and visibility along the runway had to be at least three-quarters of a mile before the aircraft could attempt a landing.

Last year, the Federal Aviation Administration certificated an automatic landing (autoland) system for the Boeing 727 that requires a decision height of only 50 feet above the ground and runway visibility of only 700 feet.

The Air Line Pilots Association believes the FAA criteria for such poor-weather landings are a safety hazard. The FAA approved these landings without adequate research and testing and without requiring certain mandatory features found in autoland systems used successfully in Europe. The members of ALPA, who have thousands of hours of airline operational experience, believe the system certificated by the FAA is unacceptable. Other technology exists that would permit safe autoland operations to the low minimums already approved by the FAA.

In August, 1975, the FAA announced its intention to establish requirements for certification of airline landings in very bad weather for the Boeing 727 and other aircraft such as the Boeing 737 and the McDonnell Douglas DC-9 that have autoland systems installed. The new weather minimum criteria (Category IIIA) were visibility along the runway (RVR) of 700 feet, and a decision height of 50 feet. (Decision height (DH) is the height above the ground at which the pilot either must see the runway ahead or end the approach and climb.)

As justification for its decision, the FAA cited the following:

- The French have successfully conducted such operations.
- Boeing has completed all Category III requirements for the 727 autoland system.
- The feasibility of conducting operations to such low weather minima was discussed at an industry meeting in August, 1973.
- The FAA conducted a series of autoland approaches with a 727 in January, 1974.
- Additional tests were run at the FAA's National Aviation Facilities Experimental Center (NAFEC) in April and July, 1974.

The Air Line Pilots Association formally protested the autoland certification in letters to the FAA on April 20, June 23, and September 15, 1977. The FAA certificated the system August 12, 1977, without responding satisfactorily to ALPA pleas to delay certification pending more complete testing and research.

ALPA has undertaken its own lengthy investigation of the FAA's justification. What we learned makes us question whether the FAA's autoland system will provide an adequate margin of safety.

French Operations. In citing the "European experience" for certificating fail-passive autoland systems to the lowest possible limits, the FAA overlooked a number of important factors. The FAA cited specifically Air Inter, a French domestic airline, which operates to minimums of 50 feet above the runway and 150 meters (492 feet) of runway visibility.

For these operations, however, Air Inter requires:

- Three-man cockpit crews, even though the aircraft may be flown with just two pilots.
- Detailed crew procedures.
- Specially-qualified and trained pilots.
- Automatic throttles and so-called "decrab" capability.
- Ability to fly a missed approach automatically.
- If the automatic system for a missed approach fails, the pilot can

take over and fly the aircraft manually using an independent gyroscopic attitude indicator.

FAA's new criteria include none of those safeguards, which ALPA believes are essential if full safety is to be assured.

Boeing Data. Clearly, Boeing has complied with the FAA criteria for certification of its autoland system and did collect all data specified by those criteria. The analysis of these data and the conclusions reached are largely dependent upon a few basic assumptions that we believe are open to question. The most notable of these are that:

- All go-around attempts following a failure in the autoland system will be successful because the failure will leave the aircraft in a position that assures a successful go-around.

- Runway visual range (RVR) of 700 feet is assumed to be adequate, according to Boeing, because that is the figure the FAA uses. The FAA says that the 700-foot distance is based on Boeing data.

- Conventional cockpit instruments are adequate to monitor the autoland system during the critical phases of approach and landing.

- The ground portion of the instrument landing system (ILS) is 100 percent reliable.

ALPA believes that a complete, scientific certification program is needed to answer the serious questions raised by these unstated assumptions in the Boeing data. Answers are particularly needed to questions about the safety of operating to 50-foot decision height and 700-foot runway visibility with fail-passive autoland systems.

Industry Meeting. The transcript of the August, 1973 meeting, which had representatives from virtually every segment of the airline industry, shows there was a

strong consensus that:

- Fail-passive autoland systems should not be authorized for operating to minima lower than Category II unless the total system reliability for such operations would be on the order of 10^{-9}.

- Establishment of the reliability would need to be demonstrated by an adequate program of test and analysis.

- This test and analysis program would necessarily consider, among other factors, the frequency of missed approach initiation at and below decision height and the risk associated with executing a missed approach at these altitudes.

- Criteria for fail-passive autoland operations below Category II limits should include consideration of aircraft geometry and pilot eye height and should require independent go-around guidance.

Flight Demonstrations. The FAA conducted 20 automatic landings at Oklahoma City. The data given to ALPA on these tests consisted of two pages: one a memo and the other a tabulation of the flights. The memo says that the RVR on the 20 flights varied from 1,000 feet to 2,200 feet. The tabulation covers only the first 14 flights and shows RVR's of 1,000 to 3,000 feet. The memo and the tabulation thus do not agree. In any event, the FAA has not tested the autoland system at the RVR of 700 feet that it proposes to allow for airline operations. Current Category II operations permit RVRs as short as 1,200 feet.

NAFEC Tests. The script for the tests called for 49 anomalies in the ILS localizer and glide slope to be introduced during the tests. Only seven were actually introduced, and none of these involved the glide slope, which provides guidance on the proper angle of descent during approach. In nine of the 44 attempted autolandings,

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the pilot disconnected the autoland system because he considered the aircraft sink rate, drift rate or position to be unacceptable. Thus, the pilot took over in more than 20 percent of the approaches in good weather. Clearly, the capability of the pilots to take control of the aircraft under the poor weather of Category III is important and needs to be established. ALPA has found no evidence that the FAA has done so.

It is obvious that the tests run at NAFEC and the flight demonstrations at Oklahoma City are not sufficient to declare the proposed autoland system safe for airline operations.

In the latest response to ALPA, in January of this year, the FAA said it has "serious doubts as to whether continuing this long-standing series of correspondence can serve any useful purpose since substantial amounts of time in both your organization and ours are being devoted to unproductive correspondence on this subject. No new information has been forthcoming, and much of our effort, which needs to be devoted to bona fide safety questions, is being diverted unnecessarily."

Rather than go away quietly, as the FAA clearly would prefer, ALPA will continue to push for higher standards of safety in commercial aviation.

CONCLUSIONS

Due to the philosophy of its design and the manner in which it has been certificated, ALPA believes the FAA has certificated a system that is unacceptable for Category III operations by itself. We believe it is superior to the conventional Category II, single-channel autopilot in all respects. We also believe that if a suitable head-up display (HUD) were used in conjunction with this system, it would be possible to operate safely into conditions as low as Category IIIA, providing that the display made sufficient information available to the pilot to enable him to perform all the tasks such a system would require him to do.

ATTACHMENT 4

COLLISION AVOIDANCE SYSTEMS

The Federal Aviation Administration was established partly as a result of a 1956 midair collision that cost the lives of 128 passengers. One of FAA's responsibilities was to improve the air traffic control system to prevent similar tragedies. More than two decades have elapsed, and the FAA is still testing and researching in its quest for a technologically "adequate" system, while it continues to depend on the outmoded "see-and-be-seen" concept.

During the 1960's, the FAA examined various concepts of independent airborne collision avoidance systems only to abandon the idea as unworkable and incompatible with a ground-based air traffic control system. Instead, the agency decided to look at the long-range development of a ground-based concept called Intermittent Positive Control (IPC). This system relayed advisory and maneuver information from ground controllers to cockpit displays. The IPC would be designed to transmit this information to the aircraft only when necessary to avoid hazardous situations.

The National Transportation Safety Board in November, 1969, convened a public hearing to investigate the causes and prevention of midair collisions. NTSB statistics showed a critical deficiency in the Nation's air traffic control system: from 1959 to 1968, there were 223 midair collisions involving U. S. registered aircraft. Nearly half, 109, were fatal, resulting in 528 deaths. Although commercial aircraft were involved in only 6.7% of the accidents, the passengers of the commercial aircraft accounted for 66% of the fatalities.

ALPA has been calling on the FAA for many years to develop and certificate an effective CAS for airline use. We have not favored any one technology; there are several that could accomplish the mission. However, we have maintained that any CAS should be installed in the aircraft to give the pilot direct, immediate knowledge of any impending threat. The FAA, on the other hand, has favored a system that would rely on computers on the ground to detect a possible collision

and transmit a warning to the aircraft. In addition to taking responsibility away from the pilot, the system proposed by the FAA would not provide any backup warning to the pilot if the ground-based equipment failed.

In the early 1970's, Congress expressed concern over the FAA's delay in solving the collision avoidance problem. This concern was sharpened by the fact that airborne collision avoidance designs that could provide some protection for commercial air carriers and other aircraft were available. In 1973, a government advisory group reached much the same conclusion. This group challenged FAA's assertion that the ground-based IPC system, though years from implementation, was the best solution.

The problem of near midair collisions intensified in the 1972-1975 period. The FAA reported a total of 1,219 air traffic control system errors -- either human, equipment or procedural failures -- that resulted in 105 near midair collisions.

By 1976, Congress was demanding a solution to the collision avoidance system problem, but the FAA hedged. It reported to the Senate Aviation Subcommittee that it had tested CAS designs from three avionics corporations, but that new developments made it necessary to wait until 1977 to set CAS criteria. Characteristically, the FAA failed to meet this self-set goal.

As far back as early 1972, ALPA was critical of the FAA for showing a lack of urgency in developing equipment that will enable the pilot to know when a midair collision is imminent. Early last year, the FAA told the Senate aviation subcommittee it intended to pursue an airborne system known as the beacon collision avoidance system (BCAS) and would have a national standard by June, 1977. At about the same time, ALPA called on the FAA to push development of BCAS and presented a list of minimal technical and operational criteria, including data to be displayed to the pilots.

In June of last year, ALPA pointed out the BCAS is compatible with the FAA's ground-based system known as the discrete address beacon system (DABS). There-

fore, it should not be considered an interim system to be used only until DABS becomes operational. Earlier this month, the FAA indicated it will issue a draft national standard for a basic BCAS by the end of this year. Under the most recent development schedule, the first operational equipment for airplanes would be available in 1982.

This BCAS, however, cannot be used in heavy-traffic areas. It will not be mandatory to install it in airline transports; thus there is no requirement for an airline to buy it. In the meantine, the FAA says it will begin to develop a concept for a more-capable BCAS that can be used in heavy traffic areas.

However, the recent experience of airline pilots has clearly shown that the danger of midair collisions continues to grow not only at the large and busy airports but also at the more numerous smaller ones. There is a mix of airline transports flying under control from the ground and other aircraft that frequently fly without such control at the smaller airports. This mix of controlled and uncontrolled aircraft is not found at the large airports.

The airline aircraft and the uncontrolled ones come close together near the airport. It is there, during approach and landing and during takeoff and climbout, that the workload of the airline flight crew is at is peak. Thus, the pilots have little time to spend looking out the window for other aircraft and, therefore, would benefit greatly from having an effective CAS in the cockpit.

The increasingly crowded air traffic control environment and crew workload are subjects that the FAA should be paying particular attention to as it prepares to certificate the transports of the future. The agency's attitude toward workload measurement is indicative of its inadequate foresight. The FAA still looks at workload as it was measured in the 1960's, with the emphasis on manual tasks. Many experts in this area point out that advances in computers and other avionics mean that the pilot of the future will have fewer manual tasks and be more of a systems monitor. Thus, the FAA will have to apply the new measuring techniques being developed to understand fully the future air transport en-

vironment and the demands it will place on the cockpit crew.

Crew workload is clearly an element to be considered by FAA flight test personnel under FAA Order 8110.4, Paragraph 165. It states:

"Particular attention and emphasis are to be given to the entire system in which an airman and his aircraft must operate. The system includes not only the airman and the aircraft but airports, air navigation facilities, the air traffic system, the safety rules and operating procedures as well as environmental factors, such as weather."

Clearly, the FAA has not fully considered the present and future operational environment in certification; if it had done so, it would have moved far more effectively to develop and certificate a CAS. As it now stands, we are no closer to certificating an effective operational collision avoidance system than we were five years ago.

ATTACHMENT 5

DC-10 CARGO DOOR

On March 3, 1974, a McDonnell Douglas DC-10 wide-bodied jet transport crashed in a forest near Paris, killing all 346 persons on board. It was the worst single-plane aircraft disaster in history. What was particularly shocking is that this tragedy was due directly to breakdowns in the aircraft certification process.

What happened has been extensively documented in two Congressional investigations and in three books. Basically, the problem was that the latching mechanisms on the doors of the cargo compartments did not always close properly. If a door was not latched properly, it could pop open in flight after the cabin was pressurized and the aircraft reached an altitude of about 12,000 or 13,000 feet. The sudden opening of a door would suck air out of the cargo compartment, causing the floor of the passenger cabin to collapse into the cargo compartment below. Collapse of the floor would damage or even sever control lines from the cockpit to the tail. With these lines damaged, the pilots could not control the aircraft.

The first hint of trouble came in May, 1970 when a cargo door latch failed and the door opened during a static test at the McDonnell Douglas plant. In November of that year, an engineer for General Dynamics, a main subcontractor for the DC-10 fuselage, wrote an internal memorandum questioning the design of the door latch mechanism and the strength of the cabin floor. Unaware of these reservations, the Federal Aviation Administration certificated the DC-10 in July, 1971.

Not quite a year later, in June of 1972, a cargo door blew out on an American Airlines DC-10 over Ontario. Fortunately, there were few passengers on the plane, and the lightly-loaded floor in the rear of the cabin did not collapse completely. Still, the control lines were damaged, and the controls jammed. The pilots, through skillful use of the two engines on the wings, were

able to land safely.

Normally, the FAA would have issued an Airworthiness Directive (AD), a mandatory order with the force of law directing the manufacturer to correct the flaw revealed by the accident. However, the FAA, at the behest of the manufacturer, did not issue an AD. Instead, the manufacturer said it would correct the door latch problem by sending service bulletins to airlines flying the DC-10. These bulletins do not have the impact of ADs, and compliance with them is voluntary.

Investigators for the Investigations Subcommittee of the House Committee on Interstate and Foreign Commerce reported that ADs are often considered marks against an aircraft. There were no ADs on the DC-10 at the time of the American Airlines accident, and the company's efforts to reach quiet agreement with the FAA should be understood in light of the fact that ADs can have an adverse effect on aircraft sales, the Congressional investigators said.

For reasons never uncovered, the cargo door modifications called for in the service bulletins were never made to the Turkish Airline DC-10 -- even though the aircraft had not yet left the McDonnell Douglas plant when the bulletins were issued and company documents indicated the modifications had been made.

The FAA did issue an AD after the Turkish Airlines crash.

In its 1975 report reviewing the FAA's performance, the House subcommittee found "a tendency for the agency to avoid the role of leadership in advancing air safety.... In some instances, this abdication of responsibility has been coupled with administrative lethargy -- a sluggishness which at times approaches an attitude of indifference to public safety."

ATTACHMENT 6

DC-8 GROUND SPOILERS

Three serious accidents, caused by accidental deployment of the ground spoilers in the air, killed 170 persons and injured at least 38 others before the Federal Aviation Administration issued a mandatory Airworthiness Directive (AD) to correct the problem.

Ground spoilers are hinged plates on the top of the wing that are designed to pop up and "spoil" the lift of the wing after the aircraft touches the runway. The spoilers help to keep the aircraft on the ground and shorten the stopping distance. When deployed in the air, however, they cause the aircraft to drop rapidly and often strike the ground.

The basic design flaw in the DC-8 ground spoilers was that the control arm was so sensitive that a slight movement in the wrong direction could deploy the spoilers immediately instead of positioning them to deploy automatically as soon as the aircraft landed.

The first sign of a problem with the spoilers occurred in 1968 with a Scandanavian Airlines System DC-8 approaching Bergen, Norway. Although there was no accident, the incident should have served as a warning to the FAA and the industry.

The second time the problem appeared, it could not be ignored. An Air Canada aircraft crashed while landing at Toronto in July, 1972 after the spoilers deployed prematurely, killing 109 persons. Later that year the FAA, over the objections of McDonnell Douglas, issued an AD advising pilots not to deploy the ground spoilers in flight. A House subcommittee called this AD "almost totally worthless" and said it did little more than tell pilots not to crash their airplanes.

Another accident occurred in November, 1972 when a Japan Air Lines DC-8 crashed after taking off from Moscow. Inadvertent deployment of the ground spoilers was suspected as the cause of that accident, which killed 61 of the 76

persons on board.

The third accident happened just seven months later when an Icelandic Airlines transport was landing at New York. The aircraft was substantially damaged, and 38 of the 128 persons on board were injured.

Not until late in that year and at the request of airlines flying the DC-8 did McDonnell Douglas devise a modification to eliminate the possibility of inadvertent spoiler deployment. The FAA issued an AD in January, 1974 requiring this modification -- almost six years after the first sign of a problem and seven months after the third accident.

ATTACHMENT 7

GROUND PROXIMITY WARNING SYSTEMS

These devices give an audible warning to the pilots when the aircraft gets too close to the ground or is descending too rapidly. They are now required on all U. S. airliners, but it took years of pleading -- and several fatal crashes -- before the Federal Aviation Administration overcame its inertia and made them mandatory.

Flying a properly functioning airplane into the ground has been a prime factor in more than half of the airline accidents in the past 20 years. In the United States alone, from 1959 to 1976, there were 59 airline crashes in which the aircraft flew into the ground. These crashes killed 2,194 persons. The majority occurred during the approach and landing phase of flight and at night or in bad weather. Pilot workload is at its height under these conditions, and pilots are often distracted. The GPWS was developed to provide an independent warning of possible danger.

Beginning in 1968, the Air Line Pilots Association recommended to the FAA that the agency require a GPWS in each airline transport. The National Transportation Safety Board, following its investigations of three crashes in 1970 and 1971, recommended each time that the FAA develop a GPWS. In 1972, the NTSB strengthened its comment by saying that a GPWS should be required. In its annual report to Congress in 1973, the Board said it "repeatedly has recommended that FAA require use of ground proximity warning equipment in airline aircraft as the single most effective means of preventing approach and landing accidents. . . ."

In April of 1973, the FAA did ask for comments on a proposed rule that would require a GPWS in each airliner. The agency was still evaluating these comments almost 18 months later when a Congressional subcommittee began looking into the issue. On December 1, 1974, an airliner hit a mountain while approaching

Dulles International Airport, kill [illegible] on board. Three days later, two senior members of the House su[illegible]ee investigating the FAA's handling of the GPWS situation called for mandatory installation of such a warning system in all airline aircraft as soon as possible.

The FAA issued a rule two weeks later requiring all airliners to be equipped with a GPWS.

Considering this record, is it any wonder that the House subcommittee termed the FAA's performance". . .a sorry example of administrative inaction and delay."

ATTACHMENT 8

HEAD-UP DISPLAY

It has long been recognized that the aviation community had little understanding of the role of outside visual cues to the pilot in the final approach and landing of an aircraft. Today, more than half of all airline accidents occur during the approach and landing phases and the majority of these have human performance and crew workload as contributing factors.

The number of accidents in this relatively short phase of flight has led to a search for a better way to display critical information to the pilot.

Recent advances in the technology of display systems have provided the tools necessary to undertake a new approach to the problem. It is unlikely that technology is any longer a limitation to the development of techniques and systems which have the potential of resolving the visual cues question.

For the past 15 years, the Federal Aviation Administration, has been studying use of an aircraft information display device that could significantly reduce the number of approach and landing accidents. This device has been operational on U. S. military aircraft for the past 10 years and is currently used by air carriers in Europe, Canada, and the Peoples Republic of China.

In bad weather the greatest danger facing the pilot as he maneuvers up to 300 tons of airplane traveling at 100 yards every 1.3 seconds is the repeated "yo-yo" transition from the instrument panel to the outside. These critical transitions are made at Decision Height when a pilot must switch from instruments to the "eyeball" technique of landing his aircraft. With modern large aircraft, the need to eliminate this critical transition phase - when a pilot must shift eye focus from instruments to the outside world - becomes increasingly important.

As far back as 1963, the FAA began development studies of a device known as Head-Up Display (HUD), that would eliminate the "yo-yo" eye focusing technique

from instruments to outside. The HUD projects crucial flight path information on a glass directly in front of the pilot's vision. The display provides a pilot the same data in color symbology as that on his instruments as he looks through the windshield at the runway before him. In this manner, he receives real visual cues enabling him to determine if he is too high, too low, or too far left or too far right. The display eliminates changing eye focus and losing precious fractions of seconds at such a critical time.

Following extensive research, the U. S. Air Force, more than a decade ago, began using a Head-Up Display for low-level navigation of high-speed combat aircraft.

At about the same time, December 1966, the FAA reported continuing research on the HUDs, but that "none of our efforts have been devoted to the refinement of hardware in the sense of prototype equipment." In response to this FAA report, the Air Line Pilots Association provided a recommendation to FAA concerning the formulating of a program to further evaluate these displays. ALPA added:

> "We feel the U. S. is already far behind in our commercial applications of Head-Up. . . Sweden and Britain have already flight tested and installed numerous systems. . . France has excellent concepts and our Navy and Air Force have very sophisticated equipment of this nature."

In November, 1971, FAA completed a contract head-up display study program at the University of California's fog chamber. Study results concluded that a prototype head-up device was extremely helpful in low-visibility conditions.

In early 1972, ALPA reminded the FAA that a program conducted for it by Sperry Gyroscope Company, which began in 1963, revealed highly favorable pilot performance with the head-up display under test conditions. Further, ALPA noted, ". . .the time has come for the FAA to move to implement the recommendations derived from the FAA-sponsored Sperry test. If the state-of-the-art was adequate

then, it is surely more so now." Also, ALPA asked the FAA to participate in NASA's research and development program for a head-up display format. The FAA refused the invitation! In a February 15, 1972 letter, the FAA published a report outlining its fog chamber testing and installation of a HUD on a Convair-880 jet transport to gain flight experience. The FAA also stated, "No operational requirement has been clearly identified for HUD."

In December 1973, the FAA began another test. In conjunction with the U. S. Air Force, it initiated a scientifically thorough study of low-visibility landing problems, including use of a HUD with a simulator. But, two years later and before actual flights were undertaken, the FAA withdrew program funding following the "recommendation" of the Air Transport Association (the organization that represents most U. S. scheduled airlines).

According to an article entitled "The Air-Safety Challenge," published in the August, 1977 issue of National Geographic, the ATA felt that FAA's study program had proceeded without their consultation and was being conducted with military hardware that might not be applicable to the needs of civil aviation.

On August 11, 1975, William T. Hardaker, ATA Vice President, wrote to FAA:

> "Our Committee had found little relation in that work statement to real needs of the all weather operations efforts, and little reason to justify expenditure of FAA funds. Our Committee therefore recommends that work under the contract be stopped and the contract terminated, or that it be converted to useful work upon which agreement can be reached with those who are to benefit."

The FAA stopped work on its head-up research.

An FAA official told National Geographic that "his agency considered the simulator 'inadequate'." A researcher on the program said he "agreed that the simulator was not adequate, nor was the study intended to address safety issues from the regulatory point of view." But, the researcher added, "the simulator was entirely adequate to examine the study's basic question: 'What must the pilot see, and for how long, to land an airplane in low visibility?'" This

question is still unanswered.

In the meantime, FAA continues its research, test and development efforts on technology - already operational for a decade in military aircraft - that could significantly reduce the hazards of landing.

FAA now faces an additional problem. Two U. S. aircraft manufacturers want to certificate a head-up display for use by air carriers, but the FAA has no criteria by which to certificate this equipment. Had any of these previously mentioned research efforts been completed, the FAA would have been in a much better position to fulfill its mandate of providing the traveling public with aircraft and equipment certificated to the highest safety standards.

ATTACHMENT 9

DC-9 STALL WARNING HORN

A stall warning horn was built into the DC-9 because the aircraft -- unlike most -- gives no warning of its own to the pilots that it is entering a stall. Under certain conditions, an aircraft stops flying when the wings do not generate enough lift to support the weight of the airplane. When that happens, the aircraft is said to "stall." This usually happens at low speeds and with the nose raised -- that is, during takeoff or approach when the pilot workload is at it highest.

The problem with the DC-9 stall warning horn is its loudness -- slightly greater than that of the Concorde supersonic transport when it is taking off. The Federal Aviation Administration required the manufacturer to make the warning horn loud enough to be heard by pilots wearing the old earmuff-type earphones (which are rarely worn today) while flying close to thunder. The FAA apparently did not consider the effects on pilots when the stall warning horn sounds accidentally.

The Air Line Pilots Association reported in early 1970 that DC-9 pilots were complaining about the loudness of the stall warning. In August, 1971, the warning horn on a Southern Airways DC-9 accidently sounded. After the incident, the captain reported, "The noise was so distracting that normal thought processes and trouble-shooting were hampered. I can imagine what the potential could be if this system activated on some dark night on approach. It would be impossible to communicate to the tower or even initiate a go-around, as commands to the first officer to raise the gear and flaps would not be heard."

Two months later, a North Central Airlines DC-9 captain told an FAA inspector the stall warning horn "was so loud it caused virtually a partial incapacitation of the thought processes of both my first officer and myself."

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ALPA complained to the FAA about the loudness of the stall warning in August, 1971, and in October, 1973, asked the agency to issue a mandatory Airworthiness Directive requiring a quieter, less distracting stall warning.

Except for a voluntary service bulletin allowing airlines to modify the warning horn, the Agency still has taken no action on this five-year-old request.

Mr. BURTON. For the record, the film that was shown was not an ALPA film but an FAA film.

Captain O'DONNELL. That is correct.

Mr. BURTON. I have in the committee file a letter dated June 19, 1974, from the Crane Hydro Air Division to Mr. Rudolph, the Director of Flight Standard Services, FAA, requesting, in effect, that that film be withdrawn because it sets out what they consider to be some inaccuracies in the film.

Do you know of your own knowledge whether or not FAA, after they withdrew the film, came up with a new film dealing with wet runways?

Mr. O'BRIEN. Yes; Mr. Chairman, the FAA did recall the film and corrections were made to the basic film. We do not have a copy of FAA's revised version and have never seen one. I am not sure if it is publicly available. There were other requests from Eastern Airlines, Boeing and other sources to recall that film for several different reasons.

The lead-in to the film shows an accident that in Eastern's opinion should not have been used.

Boeing was concerned about the use of the 727 aircraft. It was their opinion that they had followed the certification process, and the aircraft should not have been singled out for demonstration purposes.

Mr. BURTON. The fact is that they followed the certification process and yet the film showed problems with regard to wet runways? Is that right? Therefore, the FAA is shown not to have dealt thoroughly with the problem of landing on wet runways; and it was felt by Boeing that they were being unduly put upon because the 727 was their plane?

Mr. O'BRIEN. That is correct. One of the basic concerns is that the certification process does not treat the wet runway correctly. Therefore——

Mr. BURTON. Do you feel that there were legitimate inaccuracies in the film, as opposed to a claim from, let's say, Boeing, that FAA happened to use one of their airplanes and that might put them in a bad light? I am talking about how accurately the film treats planes landing on wet runways.

Mr. O'BRIEN. Some of the main technical concerns voiced by not only Boeing but the manufacturer of the antiskid system were about the corrections that had been made or improvements that had been made to the antiskid system during the time in which these tests were being conducted and following those tests.

So, when the film was released for public consumption, Hydro Air, for example, contended that corrections had been made and therefore those lockups, which you saw in the film, should not have occurred.

Captain O'DONNELL. One further thing, Mr. Chairman. It should be remembered that airline pilots make a landing or takeoff every 13 seconds around the clock. We don't operate where the runways are clean and clear of rubber, and we don't operate where the systems are under control. We operate on an airport that has a tremendous amount of rubber at the end of the runway. There is kerosene spilled on that runway that makes it very slippery. In several instances in my career, I remember landing long on a runway and the airport control tower asked us to exit before the end because somebody was behind us. I would have eased off the brakes a little bit then I had to get back on

the brakes. We were then on this rubber layer covered with kerosene. If it is wet, it is slippier than ice. That is not taken into consideration when they certificate the aircraft.

Mr. BURTON. I will move to make that letter to FAA urging the withdrawal of the film, part of the record. We will ask FAA about that.

[The material follows:]

CRANE HYDRO-AIRE DIVISION,
Burbank, Calif., June 19, 1974.

Attention: Mr. James F. Rudolph, Director of Flight Service (AFS–1).

Subject: Wet runway report/movie FA 01–74.

DEPARTMENT OF TRANSPORTATION,
Federal Aviation Administration,
Washington, D.C.

GENTLEMEN: Representatives of the Boeing Commercial Airplane Company, Douglas Aircraft Company and Hydro-Aire Division/Crane Co. met on May 30, 1974, to discuss the subject movie.

It was the joint opinion of these representatives that the movie was inaccurate and misleading when applied to an operational situation and will detract from airline safety.

The operational procedures recommended in this movie for both aircraft are not consistent with the manufacturer's recommendations or Federal Aviation Administration Air Carriers Operations Bulletin No. 74–2, dated March 15, 1974.

A direct comparison of B–727 and DC–9 stopping performance is implied; however, the test and operational conditions were not comparable. Unqualified comparison of the performance of the two different manufacturers' products by the FAA seems imprudent without prior coordination of the manufacturer.

It is therefore recommended that the FAA remove this movie from circulation. If the FAA feels the movie must be re-issued, it should be appropriately modified to clearly indicate that operational techniques were not used during the testing, to remove unqualified comparisons between two different manufacturers' products, to correct apparent and implied technical inaccuracies and to present proper stopping procedures that enhance wet runway operational safety.

Some specific comments are listed below:

A. The opening scenes regarding the accident in Akron, Ohio, on November 28, 1973, and the DC–9 landing were in poor taste and do not fit into the context of the movie; these scenes should be eliminated.

B. The introduction, at the start of the modified movie, should clarify that the joint FAA/NASA/USAF tests were conducted to obtain basic wet runway stopping correlation between two aircraft and two ground friction measuring vehicles (DBV and Mu meter) and that the test conditions for the two aircraft were different and not intended to represent operational conditions or procedures.

C. The vertical lines (on the charts) describing wet stopping distance per FAR 121.195 are misleading. The line is based upon actual dry stopping distance multiplied by 1.92. There is considerable air run distance margin available that should be additive to the wet runway distance. As an example, there is approximately an additional 1,000 feet available for wet runway stopping when the aircraft touches down at the proper point.

D. The field length discussion should be expanded. Where the wet field length is critical, factors—such as approach, touchdown speed, flare, touchdown point, getting the weight on the gear and ground spoiler deployment—should be emphasized. The charts could show certification and operational dry and wet runway distances for a specific airplane. Either manufacturer will provide the appropriate data for his respective aircraft.

E. The "standard weight" listed on some charts is misleading, since it tends to indicate that performance of the two airplanes as presented can be compared.

F. There appears to be several errors in the stopping distance charts that should be corrected.

G. The film places undue emphasis on scientific accuracy of test methods; e.g., wetting technique, etc. The measurement of water depth is prone to errors. Measured depth of water has no particular significance unless taken in context with a specific runway crown, micro and macro texture. There is a little doubt that runway texture standards require immediate attention. This aspect was not discussed in the film.

H. Specific Boeing Comments:

1. The movie statement that, "When there is a measurable depth of water that is of .02 inch or more on a smooth runway surface, the probability of wheel lock-ups is high," is incorrect. This statement is true only under specific test conditions where maximum braking is applied abruptly and is not representative of operational conditions and approval procedures. Laboratory simulation tests and operations on wet runways with published operational procedures indicate that wheel lock-ups will not occur on B–727 aircraft with Mu's greater than .05.

The many tests conducted at Boeing Field with various Boeing airplanes and operational experience support this contention. In actual operation, the pilot techniques recommended by Boeing in Operations Manual Bulletin No. 73–4 and by the FAA in Air Carrier Operations Bulletin No. 74–2 permit adequate opportunity for wheels to spin-up prior to brake application, as well as during subsequent skid activity by virtue of the fact that on slick runways airline pilots seldom, if ever, apply full brake pressure immediately after touchdown and maintain that pressure to full stop. The operating characteristics of the Mark II anti-skid valve are such that only a slight reduction in pilot-metered pressure (from 3,000 to 2,800 psi) will provide sufficient time to allow wheel spin-up following a skid and prevent wheel lock-ups on the runway conditions encountered during the FAA/USAF/NASA test program. As was mentioned in the film, Boeing has provided a locked-wheel memory circuit (Service Bulletin 727–32–209) which provides this additional wheel spin-up time even at full-metered pressure. The cautionary note advising the pilot to wait until B–727 is below 100 knots ground speed is unnecessary; it will only increase pilot's work load and result in a longer stopping distance. This practice, if adopted by airline pilots, will definitely detract from airline safety.

2. The film comments on the directional control of B–727, whereas the tests conducted had nothing to do with directional control. By inference, the safety of B–727 is questioned; and this clearly disregards over 11.35 million safe landings in every conceivable mix of weather conditions.

I. Specific Douglas Comments:

1. The following statement was made during the description of the DC–9 landing at Edwards AFB toward the end of the movie: "The run in question was a reverse thrust run. On initial touchdown, the main wheels started to spin; but when the main wheels left the runway, reverse thrust was applied together with the brakes which de-activated the spoilers." This statement is incorrect. The spoilers were retracted by the application of forward thrust necessary to maintain the high touchdown speed (approximately 1.4 Vs) for the desired test conditions. This landing could have been used to illustrate some good points; i.e., do not land fast, do not carry excessive power into touchdown, check for spoiler extension, etc. However, these items were neglected. Further, the commentary on the other landings, where the spoiler did not deploy, implied a system malfunction had occurred—where in each case the spoilers were knocked down by throttle lever advancement per normal system design.

2. The contention that the DC–9 Mark II and Mark IIIA systems are "tuned" to operate only on the front side of the Mu slip curve and therefore do not make use of peak tire-to-surface friction is incorrect and demonstrates a lack of understanding of the operational characteristics of these systems. This statement may foster a lack of confidence in these anti-skid systems, as well as lead pilots to believe that they can "beat" the anti-skid system—which is certainly not the case. Both systems are designed to release pressure *after* crossing the top of the Mu slip curve, then re-apply pressure—the goal being to achieve maximum braking effort. Therefore, all reference to "low slip ratio anti-skid system" should be removed from the film.

J. The DC–9 Mark II and 727 Mark II anti-skid systems are basically the same design; and when operated under similar conditions, similar wheel control should occur.

The preceding comments are intended to be constructive and to clarify our concern. As previously stated, we believe that this film in its present form should be withdrawn from circulation. It would be our sincere desire to work closely with the Department of Transportation if the FAA desired to re-issue the film.

Please let us know when we may be of further assistance in this endeavor.

Your truly,

DOUGLAS K. POOSE,
Applications Engineer.

Mr. BURTON. Also, there are letters of invitation to the witnesses and their responses which will be made a part of the record.

[The material follows:]

FEDERAL AVIATION ADMINISTRATION,
August 16, 1978.

Capt. JOHN J. O'DONNELL,
President, Air Line Pilots Association,
Washington, D.C.

DEAR CAPTAIN O'DONNELL: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the Federal Aviation Administration (FAA) to encourage the maximum economy and efficiency of operations.

This is to notify you that hearings have been scheduled on two areas of FAA operations: The FAA's process for certifying transport category aircraft and aircraft components, and the FAA's regulation of so-called "dry-lease" operators located in the Miami, Florida, area. Since the Air Line Pilots Association (ALPA) has been raising important questions about the certification process during the last year, I am inviting you to testify on this subject.

One of the FAA's most important duties is the certification of transport category aircraft and aircraft components. The certification process creates the foundation of aviation safety: It is the Government's determination, presumably made after exhaustive testing and analysis in all possible operational conditions, that aircraft and equipment are safe enough to insure the highest possible level of safety in air transportation.

The Subcommittee's concern over the certification process is not new. Under the chairmanship of Jack Brooks, hearings were held on June 12 and 13, 1973 on the FAA's delegation of authority to certify light aircraft. During the past year, ALPA has raised new questions about the certification process with many members of Congress. ALPA has also informally presented to the Subcommittee staff specific cases involving faulty FAA certification of certain equipment which may have created serious safety problems. ALPA has suggested that an "open" certification process could have prevented these safety problems, and therefore recommends that the process be modified.

On the other hand, the FAA has objected strenuously to ALPA's proposal to "open" the certification process. These objections are based primarily upon the need to protect proprietary commercial information held by manufacturers, and to prevent lengthy delays in the certification process itself, primarily if public hearings were frequently used. These are serious factors to be considered in any thorough examination of the process.

The Subcommittee's only concern is to determine whether the certification process has created hazards to aviation safety because of its structure or the way it is implemented, and if so, whether those hazards can be prevented by granting responsible "interested parties" reasonable access to the process and certain information used during it.

In keeping with those concerns, I am requesting that ALPA submit to the Subcommittee, a minimum of three weeks in advance of the hearing, at least four written analyses of instances where the certification process has created aviation safety hazards, and that you notify the Subcommittee staff as soon as possible which cases those will be. The purpose of this particular request is to facilitate an intelligent discussion by allowing all witnesses to address themselves to these cases. I am sure you will agree that the argument for an "open" certification process rests to a large extent on the demonstration of a direct link between actual hazards to aviation safety and the "closed" nature of the certification process.

In addition, I also request that you supply in your statement, in sufficient detail, proposals for modifying the certification process. Once again, this should encourage an intelligent discussion of how the process can be modified, if that is required.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the certification process, and during the second day, on the dry-leasing problem, though additional topics which arise before the hearings may also be introduced.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely,

JOHN L. BURTON, *Chairman.*

AIR LINE PILOTS ASSOCIATION,
Washington, D.C., September 13, 1978.

HON. JOHN BURTON,
Chairman, Subcommittee on Government Activities and Transportation, Committee on Government Operations, U.S. House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: In response to your request of August 16, I am submitting four written analyses of instances where the Federal Aviation Administration's handling of the aircraft certification process has created aviation safety hazards. These analyses are enclosed with this letter.

Briefly, they cover:

The General Electric CF–6 jet engine. The FAA did not use the most current and highest standards in certificating this engine because the manufacturer claimed it would be at an economic disadvantage if the agency used such standards. In addition, the FAA was slow to respond when operational experience revealed weaknesses in the CF–6's susceptibility to ice and bird strikes.

Wet runway standards. The FAA has ignored ALPA requests to include aircraft performance on wet runways as well as dry ones in the certification process. The mathematical arrangement now used by the FAA creates safety hazards by not accurately reflecting how aircraft perform on wet runways.

Automatic landing systems. The FAA is preparing to allow airline transports to land in very poor weather (visibility of only 700 ft. along the runway) based on inadequate testing and a misinterpretation of the French experience. It has rejected ALPA protests that its proposed standards are inadequate.

Collision avoidance systems. The FAA is still years away from developing an operational collision avoidance system (CAS) to prevent midair collisions even though the technology has been available for many years.

When I testify, I will present proposals for improving the aircraft certification process. ALPA believes these will lead to higher standards and a reduction in the bureaucratic intransigence and lethargy that has too often characterized the FAA. The final result will be higher levels of safety for the millions of American who fly.

On behalf of the 30,000 members of ALPA, I thank you for conducting this needed and independent review of the aircraft certification process. We will continue to cooperate with you any way we can in the worthwhile goal of improving aviation safety.

Sincerely,

J. J. O'DONNELL, *President.*

Enclosure.

GENERAL ELECTRIC CF–6 ENGINE

This case involves insufficient testing of a new jet engine by the manufacturer and the Federal Aviation Administration and the failure of the FAA to apply the most current certification standards. These lapses led to at least three incidents of engine failure in passenger-carrying DC–10s. The FAA's response to this evidence of a weakness in the engine was half-hearted. Only after another engine failure—in which a DC–10 valued at about $30 million was destroyed—did the Agency require changes to the engine itself to prevent future failures.

The problem with the CF–6 involved the compressor blades in the front of the engine. These blades rotate thousands of times each minute at near supersonic speed. They must be able to withstand ice, birds or other objects that are occasionally drawn into the engine. Otherwise, the blades will break and hurl metal fragments through the engine and into the wing or fuselage.

The CF–6 used compressor blades with holes drilled into the tips to save weight. However, these drilled-tip blades proved unable to withstand the impact of birds or ice drawn into engine intakes. Evidence accumulated by a special investigation subcommittee of the House Interstate and Foreign Commerce Committee revealed a critical breakdown in the airworthiness certification process as administered by the FAA.

In January of 1970, the FAA certificated the CF–6 engine as "safe". Despite the fact it was a "new technology" engine which advanced the state of the art by several stages, five-year-old and, as it turned out—unsatisfactory—certification standards were applied to the engine under the "special conditions" author-

ity vested in the FAA. Special conditions basically allow manufacturers to set their own certification standards if they can provide to FAA a satisfactory design and engineering basis for an exception to existing rules.

This was done for the CF–6 engine.

The company sought special conditions for certification of its new engine with drilled-tip blades, which had never been used before, based on the FAA's earlier certification of the Pratt & Whitney JT9D engine, which powers most Boeing 747s. The JT9D was the first high-bypass-ratio engine to enter commercial service. It and the CF–6 engine used advanced technology to produce about three times more power than earlier engines on such aircraft as the 727 and DC–9.

When certification of the JT9D was requested, the FAA did not have certification standards for high-bypass-ratio engines. Therefore, the JT9D was certificated in accordance with an Advisory Circular (AC) covering older, less powerful engines. A new AC for high-bypass-ratio engines were being written when General Electric requested certification of the CF–6. The company argued successfully that it would be an economic hardship if the FAA were to apply the new AC to its engine when it had not been applied to the earlier JT9D. Of course, the certification criteria in the new AC could not have been applied to the JT9D because they had not yet been formulated.

Thus, the FAA bowed to the manufacturer's economic arguments and did not employ the most current and stringent technical standards when it certificated the CF–6.

The House subcommittee report noted three accidents over a 14-month span of CF–6 operation during which ample evidence of difficulties with drilled-tip compressor blades was gathered. Despite these findings, however, the FAA declined to issue an Airworthiness Directive (AD) to replace drilled-tip blades with those of more conventional manufacture.

General Electric switched to solid-tip compressor blades in all its production engines, including the CF–6, in December, 1973. This did not, of course, solve the problem of several dozens of CF–6 engines with drilled tips already in service. The Air Transport Association, an airline trade association, according to the subcommittee report, estimated that it would cost $47,000,000 to convert drilled-tip CF–6's to solid tips, and opposed an Airworthiness Directive which would have mandated the conversion.

The House subcommittee investigation also disclosed that icing tests made by the Great Lakes Region of the FAA were nowhere near what could be described as exhaustive. In fact, the subcommittee report declared that test aircraft did not penetrate known icing conditions for any length of time at all in certification tests. Even at lesser icing conditions, test engines suffered damage. Nevertheless, certification proceeded.

FAA did issue an Airworthiness Directive (AD) on the CF–6. The AD, however, did not call for a fix of the engine. Rather, it called for protection of fuel lines and other control conduits on the DC–10, particularly to the No. 2, or tail-mounted engine.

That AD, issued August 23, 1974, provided only that the main fuel line to the tail engine of the DC–10 be shielded on GE-powered aircraft. Less than two months later, on October 15, the original AD was amended to provide that special shielding was necessary only on GE-powered DC–10's with drilled-tip compressor blades.

On November 12, 1975, an Overseas National Airways DC–10 began its takeoff roll at John F. Kennedy Airport. Midway down the runway, the DC–10 encountered a flock of gulls feeding from a nearby garbage dump. One of the plane's wing-mounted engines—not the high, tail-mounted engine that was the subject of the FAA's two airworthiness directives—ingested some of the flock. Its drilled tip blades disintegrated into shrapnel that blasted through the engine shroud and into the wing and fuselage. Portions of the disintegrating engine ripped through fuel lines causing jet fuel to ignite. The pilot ultimately fought the blazing aircraft to a halt off the end of the runway. His actions allowed the 139 passengers to escape, but the DC–10 was consumed by fire.

As a result of the ONA DC–10 accident at JFK, the NTSB held two public hearings. One of these hearings dealt specifically with the CF–6 engine—the engine certification requirements, type of engine failure, etc.

After the hearings, the NTSB determined that the probable cause of this accident was, "the distintegration and subsequent fire in the Number 3 engine when it ingested a large number of sea gulls". A contributory factor to the accident according to the NTSB was, "the Federal Aviation Administration and the Gen-

eral Electric Company failed to consider the effects of rotor imbalance on the abradable epoxy shroud material when the engine was tested for certification".

The NTSB then issued the following recommendations concerning the CF–6 engine:

"1. Require immediate retest of the General Electric CF–6 engine to demonstrate its compliance with the complete bird ingestion criteria of AC 33–1A. (Class I—Urgent followup.) (A–76–59).

"2. Require that any engine modifications necessary to comply with the bird ingestion criteria of AC 33–1A be incorporated into all newly manufactured CF–6 engines. (Class II—Priority followup.) (A–76–60).

"3. Require that any engine modifications necessary to comply with the bird ingestion criteria of AC 33–1A be incorporated into all CF–6 engines in service. (Class II—Priority followup). (A–76–61).

"4. Until the CF–6 engine is modified, require that a bird patrol sweep runways at all airports which have recognized bird problems and are served by CF–6 powered aircraft. The sweep should be made before a runway is put into operation for CF–6 powered aircraft and at sufficient intervals thereafter to assure that a bird hazard does not exist. (Class I—Urgent followup). (A–76–62).

"5. Advise all operators, domestic and foreign, of CF–6 engines of the catastrophic consequences of foreign objects damage and the need for appropriate caution to avoid such damage. (Class I—Urgent followup). (A–76–63).

"6. Amend 14 CFR 33.77 to increase the maximum number of birds in the various size categories required to be ingested into turbine engines with large inlets. These increased numbers and sizes should be consistent with the birds ingested during service experience of these engines. (Class III—Longer Term followup.) (A–76–64).

The FAA then issued an Airworthiness Directive (AD) requiring a modification to the engine shroud. This AD also required a retrofit for the shroud on existing engines.

The FAA has not yet acted on the last recommendation of the NTSB. Action was withheld pending an Engine Review the agency conducted last year. Results of that Review have not yet been made public.

Of the CF–6 episode, the House subcommittee commented:

". . . when the FAA is engaging in its critical function of certificating an engine or an aircraft, it must resolve any doubts on the side of caution. It did not do that in this (CF–6) instance. The CF–6 engine had drilled turbofan blades and a different anti-icing capability than previous engines. The FAA should have required simulated flight testing before certificating the engine. Moreover, when damage to the engines occurred during the icing flight tests of the aircraft, additional testing under comparable conditions should have been required of the manufacturer."

The subcommittee concluded:

"When the engine and later the aircraft (DC–10 with GE engines) encountered certification difficulties, the respective manufacturers of each descended on the FAA to forestall further testing and to expedite the certification process. This can no doubt be expected, but the FAA must resist any such pressures to shortcut its procedures. There can be no accommodation when considerations of safety must be paramount."

Wet Runway Performance

Current certification standards require that aircraft be tested only on dry runways. This failure of the Federal Aviation Administration to require testing under such a common operating condition as a wet runway has been directly responsible for many accidents and incidents. Modern airliners weigh as much as 300 tons and are traveling at about 150 m.p.h. when they land. Clearly, whether the runway is wet or dry will have a major effect on how much distance the aircraft will need to stop safely because aircraft perform far differently on wet runways than on dry ones.

For example, many transport aircraft have spoilers—devices on the top of the wing that pop up after landing to "spoil" the lift of the wing and thereby keep the aircraft on the ground and shorten the stopping distance. These spoilers are usually deployed automatically as soon as the aircraft wheels start going around. That works well on dry runways but not so well on wet ones. On runways with a thin layer of water on top, the aircraft wheels often skim across the top of the

water and do not touch the hard surface underneath. This phenomenon is called hydroplaning. In addition to making the aircraft brakes ineffective, hydroplaning also causes the spoilers not to deploy automatically because the wheels are not turning. The pilots can deploy the spoilers manually, but that takes time. During that time, the aircraft is traveling hundreds of feet down the runway.

The adverse impact that wet runways have on aircraft performance and therefore on safety means that wet-runway performance should be included in the certification process. ALPA has recommended that several times in the past. In 1973, we told the FAA that its Flight Test Handbook, which tells manufacturers how to test their aircraft for certification, should include testing on wet runways. When the Handbook appeared, however, it contained no mention of wet-runway testing. In 1974, we recommended to the FAA's Airworthiness Review a proposed rule covering aircraft performance on wet runways. So far, we have heard nothing; the FAA has neither acted on nor rejected our proposed rule.

The distance for landing on a dry runway as determined by the FAA through testing includes an allowance for such operational variables as landing long, i.e., farther down the runway than usual, and landing faster than usual. However, the experience built up over the years by airline pilots clearly shows that this allowance is insufficient when the runway is wet.

But the FAA has not required additional testing to determine scientifically what the wet runway stopping distance should be. Instead, it has glossed over this deficiency in the certification process by adding an arbitrary 15 per cent to the dry runway stopping distance to arrive at the wet runway distance.

There are two serious flaws in this procedure. First, the FAA does not define what a wet runway is. Second, the agency allows the manufacturer to demonstrate shorter landing distances than required by the 15 percent rule. Such a provision can be almost meaningless if there is no definition of a wet runway.

That is graphically illustrated by the Boeing 727. The company was able to convince the FAA that the 727 required only 7–8 per cent more to stop on a wet runway instead of the agency's estimate of 15 per cent, and the aircraft was certificated for the shorter distance.

However, later tests by the FAA and the National Aeronautics and Space Administration showed that the 727 on a truly wet runway far exceeded even the 15 percent margin. In some cases, the aircraft took about twice the dry-runway distance to stop on a wet runway. The reason is that brake application just after touchdown caused the wheels to lock. That in turn induced extensive hyroplaning, which led to the excessive runway stopping distances.

The lack of wet runway standards in the certification process has resulted in pilots developing their own techniques to cope with the problem. There have been many incidents and accidents stemming from hydroplaning; that there have not been more is a tribute to the skill and experience of airline pilots, not to the FAA's certification procedures.

Autoland Systems

In August, 1975, the Federal Aviation Administration announced its intention to establish requirements for airline operation landings in very bad weather for the Boeing 727 and other aircraft such as the Boeing 737 and the McDonnell Douglas DC–9 that have automatic landing (autoland) systems installed. The new weather minimum criteria (Category 3A) were visibility along the runway (RVR) of 700 feet, and a decision height of 50 feet. (Decision height (DH) is the height above the ground at which the pilot either must see the runway ahead or end the approach and climb.)

As justification for its decision, the FAA cited the following:

The French have successfully conducted such operations.

Boeing has completed all Category 3 requirements for the 727 autoland system.

The feasibility of conducting operations to such low weather minima was discussed at an industry meeting in August, 1973.

The FAA conducted a series of autoland approaches with a 727 in January, 1974.

Additional tests were run at the FAA's National Aviation Facilities Experimental Center (NAFEC) in April and July, 1974.

ALPA has undertaken its own lengthy investigation of the FAA's justification. What we learned makes us question whether the FAA's proposal will provide an adequate margin of safety. Our specific reservations follow:

French Experience—The French operations have many mandatory aspects that are not found in the FAA proposal. Among the many examples are use of automatic throttles, automatic landing controls, more stringent crew qualifications, more detailed crew procedures and a three-man cockpit crew even though the airplane is normally flown with only two pilots. ALPA believes that the French procedures should be mandatory in the FAA proposal if full safety is to be assured.

Boeing Data—ALPA has questions about some of the assumptions underlying the Boeing data. Included in these assumptions are that:

All go-around attempts following a failure in the autoland system will be successful because the failure will leave the aircraft in a position that assures a successful go-around.

Runway visual range (RVR) of 700 feet is assumed to be adequate, according to Boeing, because that is the figure the FAA uses. The FAA says that the 700 foot distance is based on Boeing data.

Conventional cockpit instruments are adequate to monitor the autoland system during the critical phases of approach and landing.

The ground portion of the instrument landing system (ILS) is 100 percent reliable.

ALPA believes that a complete, scientific certification program is needed to answer the serious questions raised by these unstated assumptions in the Boeing data.

Industry Meeting—The transcript of the August, 1973 meeting, which had representatives from virtually every segment of the airline industry, shows there was a strong consensus that:

Fail-passive autoland systems should not be authorized for operating to minima lower than Category 2 unless the total system reliability for such operations would be on the order of 10^{-9}.

Establishment of the reliability would need to be demonstrated by an adequate program of test and analysis.

This test and analysis program would necessarily consider, among other factors, the frequency of missed approach initiation at and below decision height and the risk associated with executing a missed approach at these altitudes.

Criteria for fail-passive autoland operations below Category 2 limits should include consideration of aircraft geometry and pilot eye height and should require independent go-around guidance.

Flight Demonstrations—The FAA conducted 20 automatic landings at Oklahoma City. The data given to ALPA on these tests consisted of two pages: one a memo and the other a tabulation of the flights. The memo says that the RVR on the 20 flights varied from 1,000 feet to 2,200 feet. The tabulation covers only the first 14 flights and shows RVR's of 1,000 to 3,000 feet. The memo and the tabulation thus do not agree. In any event, the FAA has not tested the autoland system at the RVR of 700 feet that it proposes to allow for airline operations. Current Category 2 operations permit RVRs as short as 1,200 feet.

NAFEC Tests—The script for the tests called for 49 anomalies in the ILS localizer and glide slope to be introduced during the tests. Only seven were actually introduced, and none of these involved the glide slope, which provides guidance on the proper angle of descent during approach. In nine of the 44 attempted autolandings, the pilot disconnected the autoland system because he considered the aircraft sink rate, drift rate or position to be unacceptable. Thus, the pilot took over in more than 20 percent of the approaches in good weather. Clearly, the capability of the pilots to take control of the aircraft under the poor weather of Category 3 is important and needs to be established. ALPA has found no evidence that the FAA has done so.

In the latest response to ALPA, in January of this year, the FAA said it has "serious doubts as to whether continuing this long-standing series of correspondence can serve any useful purpose since substantial amounts of time in both your organization and ours are being devoted to unproductive correspondence on this subject. No new information has been forthcoming, and much of our effort, which needs to be devoted to bona fide safety questions, is being diverted unnecessarily."

Rather than go away quietly, as the FAA clearly would prefer, ALPA will continue to push for higher standards of safety in commercial aviation.

COLLISION AVOIDANCE SYSTEMS

These are designed to give ample warning to a pilot of an impending midair collision. The need for a CAS was demonstrated in the late 1950's and early 1960's when there were several midair collisions between scheduled airliners resulting in the deaths of several hundred persons. More recently, the problem of midair collisions has been complicated by the fact that most such tragedies involve airline transports and smaller general aviation aircraft or civilian and military airplanes.

ALPA has been calling on the FAA for many years to develop and certificate for airline use an effective CAS. We have not favored any one technology; there are several that could accomplish the mission. However, we have maintained that any CAS should be installed in the aircraft to give the pilot direct, immediate knowledge of any impending threat. The FAA, on the other hand, has favored a system that would rely on computers on the ground to detect a possible collision and transmit a warning to the aircraft. In addition to taking responsibility away from the pilot, the system proposed by the FAA would not provide protection over the oceans, particularly the North Atlantic with its heavy aircraft traffic, and on airport runways.

As far back as early 1972, ALPA was critical of the FAA for showing a lack of urgency in developing equipment that will enable the pilot to know when a midair collision is imminent. Early last year, the FAA told the Senate aviation subcommittee it intended to pursue an airborne system known as the beacon collision avoidance system (BCAS) and would have a national standard by June, 1977. At about the same time, ALPA called on the FAA to push development of BCAS and presented a list of minimal technical and operational criteria.

In June of last year, ALPA pointed out the BCAS is compatible with the FAA's ground-based system known as the discrete address beacon system (DABS). Therefore, it should not be considered an interim system to be used only until DABS becomes operational. Earlier this month the FAA indicated it will issue a draft national standard for a basic BCAS by the end of this year. Under the normal development schedule, the first equipment for airplanes would be available in 1982.

This BCAS, however, cannot be used in heavy-traffic areas. It will not be mandatory to install it in airline transports; thus there is no requirement for an airline to buy it. In the meantime, the FAA says it will begin to develop a concept for a more-capable BCAS that can be used in heavy traffic areas.

However, the recent experience of airline pilots has clearly shown that the greatest danger of midair collisions occurs not at the large and busy airports but at the more numerous smaller ones. There is a mix of airline transports flying under control from the ground and smaller private aircraft that frequently fly without such control at the smaller airports. This mix of controlled and uncontrolled aircraft is not found at the large airports.

The airline aircraft and the uncontrolled ones come close together near the airport. It is there, during approach and landing and during takeoff and climb out, that the workload of the airline flight crew is at its peak. Thus, the pilots have little time to spend looking out the window for small aircraft and therefore would benefit greatly from having an effective CAS in the cockpit.

The environment in which the aircraft is to be operated is an element that needs to be considered in the certification process. Clearly, the FAA has not considered the operational environment; if it had done so, it would have moved far more effectively to develop and certificate a CAS. As it now stands, we are no closer to developing and certificating an effective operational collision avoidance system than we were five years ago.

AUGUST 15, 1978.

HON. LANGHORNE BOND,
Administrator, Federal Aviation Administration,
Washington, D.C.

DEAR MR. ADMINISTRATOR: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the Federal Aviation Administration (FAA) to encourage the maximum economy and efficiency of operations.

This is to notify you that hearings have been scheduled on two areas of FAA operations: The FAA's process for certifying transport category aircraft and aircraft components, and the FAA's regulation of so-called "dry-lease" operators located in the Miami, Florida area. Since there are very serious topics, I request your personal appearance at these hearings.

One of the FAA's most important duties is the certification of transport category aircraft and aircraft components. The certification process creates the foundation of aviation safety: It is the Government's determination, presumably made after exhaustive testing and analysis in all possible operational conditions, that aircraft and equipment are safe enough to insure the highest possible level of safety in air transportation.

The Subcommittee's concern over the certification process is not new. Under the chairmanship of Jack Brooks, hearings were held on June 12 and 13, 1973 on the FAA's delegation of authority to certify light aircraft. During the past year, the Air Line Pilots Association (ALPA) has raised new questions about the certification process with many members of Congress. ALPA has also informally presented to the Subcommittee staff specific cases involving faulty FAA certification of certain equipment which may have created serious safety problems. ALPA has suggested that an "open" certification process could have prevented these safety problems, and therefore recommends that the process be modified.

On the other hand, the FAA has objected strenuously to ALPA's proposal to "open" the certification process. These objections are based primarily upon the need to protect proprietary commercial information held by manufacturers, and to prevent lengthy delays in the certification process itself, primarily if public hearings were frequently used. These are serious factors to be considered in any thorough examination of the process.

The Subcommittee's only concern is to determine whether the certification process has created hazards to aviation safety because of its structure or the way it is implemented, and if so, whether those hazards can be prevented by granting responsible "interested parties" reasonable access to the process and certain information used during it.

In addition, the Subcommittee has become concerned about serious aviation safety problems created by a large number of so-called "dry-lease" operators, located particularly in the Miami, Florida, area. These operators, transporting passengers or cargo for hire, are able to operate under the rather lax regulations set forth in FAR Part 91 (d), rather than the more stringent regulations governing transportation for hire found in FAR Part 121. The "dry-lease" arrangement is apparently but one method of avoiding compliance with FAR Part 121. As you know, the Subcommittee has requested GAO investigators to examine the situation, and these GAO investigators will be invited to submit their preliminary findings at the hearings. Their observations, thus far communicated to the Subcommittee staff, raise major questions about the adequacy of FAA regulations, the determination of the FAA to subject these operators to strict surveillance on the one hand, and the hindrances to FAA enforcement on the other.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the certification process, and during the second day, on the dry-leasing problem, though additional topics which arise before the hearings may also be introduced.

Written or verbal questions will be posed to your staff prior to your appearance, and I would appreciate your cooperation in supplying rapid responses to these questions. I am sure that you are eager to address both of these subjects, whose seriousness I need not emphasize any further.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely,

JOHN L. BURTON,
Chairman.

AUGUST 15, 1978.

Mr. JAMES B. KING,
Chairman, National Transportation Safety Board,
Washington, D.C.

DEAR MR. CHAIRMAN: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the National Transportation Board, to encourage the maximum economy and efficiency of operations.

This is to notify you that hearings have been scheduled on two areas of FAA operations, which should also be of concern to the NTSB.

One of the FAA's most important duties is the certification of transport category aircraft and aircraft components. The certification process creates the foundation of aviation safety: It is the Government's determination, presumably made after exhaustive testing and analysis in all possible operational conditions, that aircraft and equipment are safe enough to insure the highest possible level of safety in air transportation.

The Subcommittee's concern over the certification process is not new. Under the chairmanship of Jack Brooks, hearings were held on June 12 and 13, 1973 on the FAA's delegation of authority to certify light aircraft. During the past year, the Air Line Pilots Association (ALPA) has raised new questions about the certification process with many members of Congress. ALPA has also informally presented to the Subcommittee staff specific cases involving faulty FAA certification of certain equipment which may have created serious safety problems. ALPA has suggested that an "open" certification process could have prevented these safety problems, and therefore recommends that the process be modified.

On the other hand, the FAA has objected strenuously to ALPA's proposal to "open" the certification process. These objections are based primarily upon the need to protect proprietary commercial information held by manufacturers, and to prevent lengthy delays in the certification process itself, primarily if public hearings were frequently used. These are serious factors to be considered in any thorough examination of the process.

The NTSB's knowledge of the current state of aviation safety, gained through investigations of aircraft accidents and special studies, should allow the agency to evaluate whether the FAA certification process has resulted in hazards to aviation safety. If the NTSB can make such an evaluation, it might then suggest how the certification process can be modified by allowing responsible, interested parties to have reasonable access to the process. In this regard, since the NTSB already designates interested parties for accident investigations where the confidentiality of data and findings must be maintained, the NTSB should present its views on applying that same practice to the certification process.

The Subcommittee's only concern is to determine whether the certification process has created hazards to aviation safety because of its structure or the way it is implemented, and if so, whether those hazards can be prevented by granting responsible "interested parties" reasonable access to the process and certain information used during it.

In addition, the Subcommittee has become concerned about serious aviation safety problems created by a large number of so-called "dry-lease" operators, located particularly in the Miami, Florida, area. These operators, transporting passengers or cargo for hire, are able to operate under the rather lax regulations set forth in FAR Part 91(d), rather than the more stringent regulations governing transportation for hire found in FAR Part 121. The "dry-lease" arrangement is apparently but one method of avoiding compliance with FAR Part 121. As you know, the Subcommittee has requested GAO investigators to examine the situation, and these GAO investigators will be invited to submit their preliminary findings at the hearings. Their observations, thus far communicated to the Subcommittee staff, raise major questions about the adequacy of FAA regulations, the determination of the FAA to subject these operators to strict surveillance on the one hand, and the hindrances to FAA enforcement on the other.

Once again, these are serious safety problems which the Board has already commented on. You should therefore be prepared to submit all relevant data or ideas concerning the FAA regulation of this problem area gained through accident investigations or special studies.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the certification process, and during the second day, on the dry-leasing problem, though additional topics which arise before the hearings may also be introduced.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely.

JOHN L. BURTON,
Chairman.

AUGUST 16, 1978.

Hon. ELMER B. STAATS,
Comptroller General of the United States, General Accounting Office, Washington, D.C.

DEAR MR. STAATS: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB), to encourage the maximum economy and efficiency of operations.

This is to notify you that hearings have been scheduled on two areas of FAA operations: The FAA's process for certifying transport category aircraft and aircraft components, and the FAA's regulation of so-called "dry-lease" operators located in the Miami, Florida, area. I am inviting you or your designee to testify on the latter topic.

The Subcommittee has become concerned about serious aviation safety problems created by a large number of so-called "dry-lease" operators, located particularly in the Miami, Florida, area. These operators, transporting passengers or cargo for hire, are able to operate under the rather lax regulations set forth in FAR Part 91(d), rather than the more stringent regulations governing transportation for hire found in FAR Part 121. The "dry-lease" arrangement is apparently but one method of avoiding compliance with FAR Part 121.

As you know, on May 15, 1978, the Subcommittee requested the GAO to examine the situation, and GAO investigators have been in the field, and have reported their observations to the Subcommittee staff on a continuing basis. Their observations raise major questions about the adequacy of FAA regulations, the determination of the FAA to subject these operators to strict surveillance on the one hand, and the hindrances to FAA enforcement on the other. I, therefore, request that these investigators present their preliminary findings to the Subcommittee on September 28.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the certification process, and during the second day, on the dry-leasing problem.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely,

JOHN L. BURTON,
Chairman.

AUGUST 16, 1978.

MR. KARL G. HARR,
President, Aerospace Industries Association of America, Inc., Washington, D.C.

DEAR MR. HARR: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) to encourage the maximum economy and efficiency of operations.

This is to notify you that hearings have been scheduled on two areas of FAA operations: The FAA's process for certifying transport category aircraft and aircraft components, and the FAA's regulation of so-called "dry-lease" operators located in the Miami, Florida, area.

Since the Aerospace Industries Association of America, Inc. (AIA) represents aerospace manufacturers whose products are the subject of the certification process, I am inviting you or your designee to offer testimony on that subject as it is described in the following paragraph. In the interests of time, it is my hope that AIA can present to the Subcommittee the views of all manufacturers of transport category aircraft who wish to participate in the hearings.

One of the FAA's most important duties is the certification of transport category aircraft and aircraft components. The certification process creates the foundation of aviation safety: It is the Government's determination, presumably made after exhaustive testing and analysis in all possible operational conditions, that aircraft and equipment are safe enough to insure the highest possible level of safety in air transportation.

The Subcommittee's concern over the certification process is not new. Under the chairmanship of Jack Brooks, hearings were held on June 12 and 13, 1973 on the

FAA's delegation of authority to certify light aircraft. During the past year, ALPA has raised new questions about the certification process with many members of Congress. ALPA has also informally presented to the Subcommittee staff specific cases involving faulty FAA certification of certain equipment which may have created serious safety problems. ALPA has suggested that an "open" certification process could have prevented these safety problems, and therefore recommends that the process be modified.

On the other hand, the FAA has objected strenuously to ALPA's proposal to "open" the certification process. These objections are based primarily upon the need to protect proprietary commercial information held by manufacturers, and to prevent lengthy delays in the certification process itself, primarily if public hearings were frequently used. These are serious factors to be considered in any thorough examination of the process.

The Subcommittee's only concern is to determine whether the certification process has created hazards to aviation safety because of its structure or the way it is implemented, and if so, whether those hazards can be prevented by granting responsible "interested parties" reasonable access to the process and certain information used during it.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the certification process, and during the second day, on the dry-leasing problem.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely.

JOHN L. BURTON,
Chairman.

AUGUST 23, 1978.

Hon. JOHN L. BURTON,
Chairman, Subcommittee on Government Activities and Transportation, Committee on Government Operations, U.S. House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: We have received your letter of August 16, 1978, inviting the Aerospace Industries Association to testify on certification of transport aircraft. As president of AIA, I will be pleased to present the views of the major manufacturers on September 26, 1978.

Yours very truly,

KARL G. HARR, Jr.

AUGUST 21, 1978.

Mr. PAUL R. IGNATIUS,
President and Chief Executive Officer,
Air Transport Association of America, Washington, D.C.

DEAR MR. IGNATIUS: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) to encourage the maximum economy and efficiency of operations.

This is to notify you that hearings have been scheduled on two areas of FAA operations: The FAA's process for certifying transport category aircraft and aircraft components, and the FAA's regulation of so-called "dry-lease" operators located in the Miami, Florida, area. Since the Air Transport Association of America (ATA) represents air carriers who utilize the aircraft and aircraft components certified by the FAA, I am inviting you or your designee to offer testimony on the certification process.

One of the FAA's most important duties is the certification of transport category aircraft and aircraft components. The certification process creates the foundation of aviation safety: It is the Government's determination, presumably made after exhaustive testing and analysis in all possible operational conditions, that aircraft and equipment are safe enough to insure the highest possible level of safety in air transportation.

The Subcommittee's concern over the certification process is not new. Under the chairmanship of Jack Brooks, hearings were held on June 12 & 13, 1973 on

the FAA's delegation of authority to certify light aircraft. During the past year, ALPA has raised new questions about the certification process with many members of Congress. ALPA has also informally presented to the Subcommittee staff specific cases involving faulty FAA certification of certain equipment which may have created serious safety problems. ALPA has suggested that an "open" certification process could have prevented these safety problems, and therefore recommends that the process be modified.

On the other hand, the FAA has objected strenuously to ALPA's proposal to "open" the certification process. These objections are based primarily upon the need to protect proprietary commercial information held by manufacturers, and to prevent lengthy delays in the certification process itself, primarily if public hearings were frequently used. These are serious factors to be considered in any thorough examination of the process.

The Subcommittee's only concern is to determine whether the certification process has created hazards to aviation safety because of its structure or the way it is implemented, and if so, whether those hazards can be prevented by granting responsible "interested parties" reasonable access to the process and certain information used during it.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the certification process, and during the second day, on the dry-leasing problem.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely,

JOHN L. BURTON,
Chairman.

AIR TRANSPORT ASSOCIATION OF AMERICA,
Washington, D.C., August 29, 1978.

Mr. JOHN L. BURTON,
Chairman, Government Activities and Transportation Subcommittee, Committee on Government Operations, House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: This is in response to your letter inviting the Air Transport Association to testify on September 26 during hearings you have scheduled to address the FAA aircraft certification process.

ATA. on behalf of our member carriers, will be pleased to testify on the certification process September 26.

Our witness will be General Clifton F. VonKann, Senior Vice President, Operations and Airports. He will be accompanied by V. W. Ballenger, Director, Engineering.

We will plan to provide the Subcommittee office 50 copies of our prepared statement at least 24 hours before the hearing date.

Sincerely,

LEO SEYBOLD,
Vice President, Federal Affairs.

AUGUST 21, 1978.

Mr. JOHN H. WINANT,
President, National Business Aircraft Association, Inc., Washington, D.C.

DEAR MR. WINANT: The Subcommittee on Government Activities and Transportation maintains a vigilant oversight of the Federal Aviation Administration (FAA) and National Transportation Safety Board, to encourage the maximum economy and efficiency of operations.

The Subcommittee has become concerned about serious aviation safety problems created by a large number of so-called "dry-lease" operators, located particularly in the Miami, Florida, area. These operators, transporting passengers or cargo for hire, are able to operate under the rather lax regulations set forth in FAR Part 91 (d), rather than the more stringent regulations governing transportation for compensation or hire found in FAR Part 121. The "dry-lease" arrangement is apparently but one method of avoiding compliance with FAR Part 121.

As you know, the Subcommittee has requested GAO investigators to examine the situation, and these GAO investigators have been invited to submit their preliminary findings at the hearings. Their observations, thus far communicated to the Subcommittee staff, raise major questions about the adequacy of FAA regulations, the determination of the FAA to subject these operators to strict surveillance on the one hand, and the hindrances to FAA enforcement on the other.

Since the National Business Aircraft Association, Inc., represents owners and/or operators of a large number of primarily corporate aircraft operated under FAR Part 91 (d), and since the adequacy of the current FAR Part 91 (d) will be discussed at the hearing, I am inviting you or your designee to offer testimony on the "dry-lease" problem as it has been discussed above.

The hearings have been scheduled for September 26 and 28, 1978, and will begin on each day at 9:00 a.m. in Room 2247, Rayburn House Office Building. It is anticipated that during the first day, the Subcommittee will concentrate on the FAA's certification of transport category aircraft and aircraft components, and during the second day, on the dry-leasing problem.

In keeping with the rules of the House and Committee, we request that you supply the Subcommittee office with 50 copies of your prepared statement at least 24 hours before the hearing date.

I look forward to your testimony.

Sincerely,

JOHN L. BURTON,
Chairman.

Mr. BURTON. Could you elaborate on some of the more important findings listed on pages 4 and 5 of your prepared statement? Could you draw examples from the four cases you used? If you choose to do it in writing later, that will be fine, either way.

Captain O'DONNELL. If we may, Mr. Chairman, we would like to single out one because of the importance. We would like to talk about the collision avoidance system.

Mr. BURTON. That will be fine.

Mr. COTTON. Mr. Chairman, I am William Cotton. I am chairman of the ALPA Air Traffic Control Committee. The subject of collision avoidance systems is one that has been with us for a very long time. We have been among the leaders of the industry since the idea was first formed in promoting the need for a collision avoidance system to back up the air traffic control system, whose primary function is to separate aircraft.

This has been a very long and frustrating process, and one that is continuing to frustrate us even to this very day.

Early efforts to produce a satisfactory collision avoidance system that would meet the requirements and work and that would be affordable by the aviation industry resulted in a decision in early 1976 to pursue what was known as the beacon collision avoidance system. This was designed to operate in conjunction with the air traffic control transponder, which is installed in most of the aircraft in the United States today.

At that time, we were told that the national standard would be forthcoming about the middle of 1976. This date came and passed, and we were then told that the national standard for beacon collision avoidance systems would be in the middle of 1977.

We were dismayed by this, but at least encouraged that the FAA was at least progressing with the design and that it might serve our needs.

Then, after hearing very little for the last year, in late August of this year we were told that the national standard would be available by the end of this year, 1978.

Just yesterday, again trying to find out about when this national standard would be available, we were told that it would be some time during 1979. This is the draft national standard on which the public could comment.

We were told that the results of this public comment period would be available some time around October 1980.

We feel that the reason for this delay and constant postponement is that the FAA has under design another type of collision avoidance system which is ground-based in nature. It depends on the same surveillance system that would be used to control air traffic. It removes almost all the equipment requirements from the airplanes.

This system depends on a new type of transponder that is only now under development. It looks as though it would be at least another decade before this is installed in many of the aircraft in this country.

However, we have a situation where the FAA is evaluating one system against another. One of them is its own design. The other, which has been thrust upon them by other members of the aviation community, is there. We do not feel that they have been fair in conducting this evaluation.

It looks to us as though the result has been this continual delay and postponement of an effective airborne collision avoidance system.

Mr. BURTON. Thank you.

How often is ALPA given the opportunity to comment on the standards developed by FAA for certification of a particular aircraft system? Are you ever denied knowledge of the standard until it becomes public, or until it becomes too late?

In other words, do you get a chance for input before the package is tied up?

Captain MELVIN. I am sorry. I did not understand the question.

Mr. BURTON. Are you given a chance to comment before they make a decision?

Captain MELVIN. Yes, sir. We have periodic times that we meet with the Government. They invite us in for industry review of regulations, and we make our comments.

The major problem that we have is the administration of the regulation. We never know how exactly the interpretation was made. It is lack of disclosure that causes our greatest pain. This is the problem with the chart that was illustrated. Had we had the chart, we could have determined for ourselves exactly whether the brakes were applied at a particular place that we call the V_1 speed. You cannot determine that and you cannot determine what special deals were made during the certification process that you do not know about.

We have numerous examples of these. This is a major point of one of our complaints.

Mr. BURTON. Is the certification process made between representatives of the industry and the FAA?

Captain MELVIN. The regulation is usually specific. An example is the V_1 speed and how it is to be administered. The V_1 was defined as the engine failure speed. However, unilaterally in certain certification processes, the manufacturers were allowed to redefine the engine failure recognition speed, which meant that the brakes were applied in the case of one aircraft at the speed of V_1. This was not known to us until probably 10 years after the aircraft was certified.

Meanwhile, we are getting all kinds of information that is erroneous about how this certification standard was actually applied.

Mr. BURTON. My question is this. You are talking about opening up the process. What is the process now? You have the industry manufacturers and the FAA acting together to the exclusion of others, or is it FAA's sole determination, or what?

Captain MELVIN. The industry is invited to comment. The FAA makes the decisions.

Mr. BURTON. In other words, the industry is invited to comment, and you are invited to comment, and you are therefore on an equal footing with the industry?

Captain MELVIN. I would say so in making the actual regulation, yes. It is the implementation of the regulation that causes us our concern.

Mr. BURTON. What is the hangup with an open hearing if you are already allowed to comment equally with the other interested parties?

Mr. O'BRIEN. Let me supplement Mr. Melvin's comments a bit. He is entirely correct in that the regulatory aspects of the certification process are open to comment, suggesting changes to anybody who wants to petition for rule changes.

The main problem we are finding is that the certification process is a closed process and is strictly between the manufacturer, the person who applies for a type certificate, and the FAA.

Mr. BUTTERWORTH. I think what we are trying to get at are the two types of standards. One is the basic standard contained in the Federal Air Regulation, which has to go through the rulemaking process when it is formulated or amended. Am I not correct in stating that there are other documents which then spell out how that rule is to be interpreted? You have advisory circulars, internal orders, and so on.

Those, I understand, do not have to be published in the Federal Register.

Are those as important as the FAR's?

Mr. O'BRIEN. I would say they are more important because the Federal air regulations do not specify exactly how the certification process is supposed to be run or how a particular piece of equipment or aircraft is exactly certificated.

The level of importance would be the advisory circular, which describes the certification process for a particular component or system, and then below that you have what are called internal guidelines, orders, or notices. These are the Bible of the certification process.

These documents are not open for public scrutiny. No industry input, or at least no industry input in a general sense, is asked for on those particular documents.

In the particular cases, the four cases that we have submitted, we have extracted comments or direct quotes from, for example, notice 8110.4, which is a certification standard.

You will notice, if you look at those quotes, that there are several things the FAA is required to do that are not being done today.

Mr. BUTTERWORTH. In the FAA's chart of the certification process [indicating], we have the "establish certification basis." Can this basis be cited as an advisory circular, or a notice, as well as an FAR?

Mr. O'BRIEN. That is correct.

In many cases the only information available insofar as the certification process is concerned is contained in an advisory circular. As a caveat at the beginning of the advisory circular, it says, "This is one means but not the only means" to do whatever is covered in the circular.

Mr. BURTON. At this time I have more questions, but I yield to Mr. Walker.

Mr. WALKER. Captain O'Donnell, your statement is very important. It is also one of the strongest statements I have heard before this subcommittee since I have been on this committee. And particularly in light of yesterday's tragedy, I think there are a couple of things here that really disturb me.

In the section in which you are talking about a collision avoidance system, it seems to me that you go almost as far as accusing FAA of complicity in the kinds of accidents that took place yesterday when you state that the FAA found 13 of the 15 could have been prevented. Previously such systems had been on board—am I interpreting what you are saying correctly?

Captain O'DONNELL. Absolutely correctly, sir.

Mr. WALKER. Then a little bit later in your statement, you say "We think the public would be outraged to learn that FAA does little more than rubberstamp what the manufacturer does." Are you putting the manufacturers, then, into this same category? Are you charging almost complicity for the accidents that take place?

Captain O'DONNELL. I don't want to go that far. We have met with the manufacturers many times. They have told us that they will build whatever the customer wants to buy. The customer, of course, is the airlines. The airlines also are dictated to by economics.

Too frequently, the FAA will bend to the wishes of the airline companies and the manufacturers in certifying or approving certain equipment or not putting the equipment in the aircraft that should be there.

Look how many years went by before we could get radar in our aircraft. We knew we had a problem with thunderstorms, but we had to lose some airplanes before we could get radar in them.

Look at the DC–10. The DC–10 cargo door is what I am talking about. We don't want to keep going back to that because there are many other examples of the same type of closed room deals between the FAA and the manufacturers. We don't find it out until we bang an airplane someplace, and they cop out by saying it is a pilot error. That gets the FAA off the hook and gets the manufacturer off the hook, and the pilot is out there exposed.

We are human. We do make errors. But by the same token, we should not be used as a scapegoat every time the Government or manufacturers make a mistake.

Mr. WALKER. If I am right about the accounts that I have heard about yesterday's airplane crash, the fact that the two pilots had eyeball contact with each other was not sufficient. The accident could have been avoided if a collision avoidance system was employed at the scene.

Captain O'DONNELL. There are two points. No. 1, if we had in place today, or yesterday, the collision avoidance system the FAA has been talking about, it would not have prevented that accident. Because the

collision avoidance system they are talking about will not work in the San Diego and other high density areas. In fact, it is supposed to be shut off.

No. 2, we cannot speculate as to what happened to that airplane until we listen to the tapes and everything else. Assuming for a second that, as reported by the FAA in this morning's Washington Post, the two aircraft were advised that they were in the area of each other. I understand from reading the newspaper that the 727 was in a steep bank making a final approach turn, and witnesses saw the light airplane ascend up into the wing. I cannot believe three pilots in one aircraft and two in the other are going to knowingly fly into each other. The fact that they had pointed the other airplane out to them makes one point. I cannot believe they would fly into each other knowingly. So, how it happened, I do not know. I cannot speculate.

Mr. WALKER. Your prepared statement talks about the fact that you find inexcusable that there are known hazards with known solutions that go on uncorrected. But, now if I interpret what you have just told me, one of these solutions is not something that would take care of the high-density areas. Is that right?

Captain O'DONNELL. There are known solutions that would take care of it, but not the one that the FAA is pushing. The FAA is pushing its own favorite avoidance system. We say that there is a collision avoidance system that will prevent these.

There are two ways. No. 1, they ought to control and give positive separation to all the aircraft in the high-density areas. No. 2 is one we think is necessary. I would like to have Mr. Cotton speak to that.

Mr. BURTON. Excuse me, you are not stating for the record that a collision avoidance system would not have prevented that. What you are saying is that the one currently proposed by the FAA would not have prevented that accident; is that right?

Captain O'Donnell. That is correct.

Mr. BURTON. Mr. Cotton?

Mr. COTTON. I earlier made reference to a system known as beacon collision avoidance system. This is a generic term that applies to a range of capabilities and equipment. The particular equipment that is now being pursued by FAA is severely limited in that in an area of high traffic density, it would cause interference among the radio signals involved. So it would need to be turned off. In fact, in the Aviation Week article of September 4, there is a picture showing the United States with little circles around all of the areas where the traffic is considered to be too dense for this system to work.

This is it right here, Mr. Chairman. [Indicating.]

San Diego is one of areas circled.

But, there is a beacon collision avoidance system more complex in nature, but it can handle the high traffic density. This is what we were originally told the FAA was pursuing. This is the system we would like to see developed and implemented at the earliest possible time.

Mr. WALKER. So you are saying that the technology does exist as far as you are concerned, and I assume you have done some research on this. You are saying that the technology does exist, but that FAA at the present time does not seem to be pursuing that technology; is that right?

Mr. COTTON. That is right. FAA personnel were pursuing it until recently. In fact, they did rather extensive flight testing with hardware in airplanes at their own experimental center at Atlantic City.

After this was done, the contract was abruptly terminated. To me, it was inexplicable.

Mr. WALKER. If I take what Captain O'Donnell said a few moments ago, the manufacturers are perfectly willing to put this kind of equipment aboard their airplanes if FAA goes ahead and certifies that kind of equipment? You don't have any reason to believe the manufacturers are not willing to include that safety equipment on airplanes, do you?

Mr. COTTON. They would include it, but it is not required under the current certification rules.

Mr. WALKER. Who is blocking? Who is doing all the delaying of at least investigating moving toward including that equipment? Is it the airlines? Or who is causing the delay? I think that we had about 3 years of delay that you mentioned in your testimony. Where is that delay coming from? Is it bureaucratic incompetence? What is it?

Captain O'DONNELL. I think Mr. Bond should answer that. In our view it has been the FAA. There are two reasons. I don't want to tie it to total incompetence. I think there is some incompetence. If you look at what we have been trying to get for the last 10 or 12 years, and the slow progress, we have to think it is more than foot-dragging.

No. 1, we think the FAA is committed to a ground-based ATC system, and that perhaps the on-board equipment would reduce the need for the type of ground-based system.

Mr. WALKER. Why do you think they are committed to that system?

Captain O'DONNELL. I could speculate why they are. We are opposed to it. We have been opposed to it for many, many years. Maybe Mr. Cotton can give you the reasons.

Mr. WALKER. They must have reasons why they have settled in on the system you say is not going to help in the high-density areas where you have the greatest possibility of having accidents. There must be some reason why they have settled on that particular kind of system.

Mr. COTTON. As I tried to point out earlier, they do have a competing system under evaluation that uses portions of their planned ground system of the future.

Mr. WALKER. So we have commercial competition going here that is impacting on FAA?

Mr. COTTON. It would be a philosophy rather than a commercial competition. One system is the FAA's own against the other system.

Mr. BURTON. Who pays for the ground system?

Mr. COTTON. Taxpayers.

Mr. BURTON. The FAA?

Mr. COTTON. Yes.

Mr. BURTON. If you have to put them in the aircraft, that cost is borne by the industry?

Mr. COTTON. That is correct.

Mr. WALKER. FAA is developing their ground-based systems whereas the commercial manufacturer is developing the air-based system. Is that what you are saying?

Mr. COTTON. The FAA has let contracts for what development has gone on in the airborne system. This development is going on under the auspices of the FAA, but at the urging of the industry.

Mr. WALKER. What I am attempting to nail down here is this. Where should this committee go to fix the responsibility for the fact that the technology is out there ready to go. You say there is technology. You make the flatout statement that there is complicity on the part of FAA in terms of the accidents that have happened in air-to-air collisions.

I assume that you are flatly telling this subcommittee then that there is strong legislation needed to give new direction to FAA in this area. Is that correct? Is that a summation of much of what is in your statement here today?

Captain O'DONNELL. In the whole certification area, not just in the limited area of collision avoidance. We think the whole certification process needs strong legislation.

Three congressional committees over the last 7 years have spoken out harshly against the FAA for operating in the dark. The whole certification process is suspect, and yet the FAA has done nothing to clean up its own house in this time. Yet, we still have accidents occurring that are preventable accidents, and nothing is being done about it.

The collision avoidance system is only one thing. We discuss it today because of yesterday's accident. But there are so many others, such as low-visibility approaches. There is the instrument landing system. The FAA has been dragging its feet for years. We have been coming to the Congress for years to ask for help in installing safety equipment designed 30 years ago. Many airports don't have this equipment today, such as full ILS systems and full approach light systems.

The FAA has a fund with over $2 billion in surplus. Why does the FAA not spend the money? The agency is leaving it there hoping to get its fingers on it to cover its day-to-day operations. It has attempted this for the last 3 years. Last year it got some of it. It is going to keep doing it until it gets it all.

Mr. WALKER. Thank you, Mr. Chairman.

Mr. BURTON. One question before I yield. On wet runway performance, as I understand it, everybody agrees that the easiest thing would be to groove runways. Is that right?

Captain MELVIN. It is widely recognized by all of the test data and this film also, despite any controversy, that a grooved runway presents a very desirable surface even when it is contaminated. In fact, a well-grooved runway that is kept clean will provide almost the same friction coefficient that a dry runway will.

Mr. BURTON. The funding for grooving airport runways would come out of what—the trust fund?

Captain MELVIN. Ninety percent of the funding is available from ADAP funds.

Mr. BURTON. They have a surplus, or had a surplus until a recent bill, of some $2 billion—and it grows every year. Is that not correct?

Captain O'DONNELL. They still have the surplus. It could be spent in improving runways and putting in safety equipment.

Mr. BURTON. It seems to me that it would have been nice to have dropped that into the bill last week that provided the grants to airports as well as the money given to the airlines.

Mr. Moffett?

Mr. MOFFETT. Thank you, Mr. Chairman.

I came here a little late, but I was glad to hear most of what Captain O'Donnell had to say.

With regard to yesterday's accident, I know it would be unfair and incomplete to attempt to come to conclusions about it today.

However, we have Congressman Van Deerlin sitting over here, in whose district the accident took place. I know that one of the things that is plaguing him—and it seems like a simple question—is why, in a busy area like that, do we have instructor flights at the same time as you have large planes coming in? Not far away, as I understand it, there are Navy touch-and-go flights off carriers going on. Does that make sense to you? Have you taken a position on this kind of situation where you have a very busy airport with small planes and instructor flights, and Navy flights, and all those sorts of things going on?

Captain O'DONNELL. We have taken a position. We recognize that general aviation must exist, but we also take a very strong position that in high-density areas, there should be positive separation of the aircraft. If we don't have the positive separation, then we are going to have these accidents.

Mr. MOFFETT. Could you explain that to us? What does it mean?

Captain O'DONNELL. Maybe Mr. Cotton could respond.

Mr. COTTON. That means that all of the aircraft within a particular section of air space are under a common control system whose responsibility it is to maintain separation among all the aircraft.

Mr. MOFFETT. What is the situation now in terms of control?

Mr. COTTON. In most of the air space, this is not the case.

Mr. MOFFETT. Was the small plane yesterday likely to be under the same control as the larger one?

Mr. COTTON. He did not need to be.

Mr. MOFFETT. We don't know?

Mr. COTTON. That's right.

Mr. MOFFETT. How about the Navy aircraft? Would they be under the same control?

Mr. COTTON. No; they need not be, either.

Mr. MOFFETT. Strictly as a layman asking these questions, I wonder what then is the safeguard in that situation? We are not saying there was, but if you have separate control over a small plane and a large commercial carrier, and the Navy plane, is it strictly radar on the ground?

Mr. COTTON. No, sir. It is strictly that you look out the window and look out for him.

Mr. MOFFETT. That's it?

Mr. COTTON. That's right.

Captain O'DONNELL. Recently the Administrator of FAA testified before the Congress that he perceives that the see-and-avoid air traffic separation system is going to be the touchstone of our ATC system for the future. That is lunacy because as long as you depend on a man looking out of a window separating himself from somebody else, we will have accidents.

Mr. MOFFETT. How many traffic advisories do you see? How frequent are they? How often does that happen?

Mr. COTTON. Probably several times on every approach.

Mr. MOFFETT. Several times?

Mr. COTTON. That is right—en route as well.

Mr. MOFFETT. Without having any great experience in this area, it seems incredible to me that we are leaving airline passengers and this critical issue of safety to having people look out the window of the aircraft. That is what you are telling me; right?

Mr. COTTON. That is exactly right, and it is incredible to us, too.

Mr. MOFFETT. That is the case?

Mr. COTTON. Yes.

Mr. MOFFETT. What does the FAA say to you? What do they say to you about your plea? Your plea seems to make a lot of sense to me and perhaps to some other members of the subcommittee. I think Mr. Walker was at least implying that he thought it made some sense.

What do they say to you in response?

Mr. COTTON. On the subject of collision avoidance, they say, "Look at the figures." If you look at where accidents are happening and people are being killed, not many are being killed in midair collisions so——

Mr. MOFFETT. Over the last 30 years the major disasters have taken place in midair; is that right?

Mr. COTTON. That is the major disasters. But in terms of numbers, it is not as large as the numbers killed in other types of accidents. For this reason, it does not receive the attention that some other areas have.

Mr. MOFFETT. How does that square with what happened yesterday?

Mr. COTTON. Overnight the statistics can change. That is exactly right.

Mr. MOFFETT. Are we regulating after the fact here? Do we have to have people used as guinea pigs? You can hear any place in this country whether in a tavern or in a congressional town meeting back home that our system does not act until something horrible happens. Is this another case of that?

Captain O'DONNELL. Congressman, you were reading my statement before the U.S. Senate of 1972 and 1973 where I said the only thing that will force the FAA to move is when they kill a certain number of people.

If you kill 40 to 50 people, you will not get the problem solved. So, you have to kill roughly 100 people. At St. Thomas airport, we had a couple of accidents, and they only killed 8 and 12 people. But as soon as American Airlines went in there and killed 40 people, we had the FAA go in and extend the runway.

In 1956 we had a midair collision over the Grand Canyon. The Federal Aviation Act was passed and we got a bureaucracy to solve the midair collision problem. Explain that to 150 people who got killed yesterday, and how they have solved it. I am talking about 22 years later. We are saying that the U.S. Congress is the only body that can wake the FAA up and get action.

Mr. MOFFETT. Where do the controllers come out on this issue?

Captain O'DONNELL. I could not speak for them.

Mr. MOFFETT. Have they testified before the Congress and said that the current system is inadequate, or have they not?

Captain O'DONNELL. They are Government employees. I don't know what their position would be.

Captain DECELLES. I am Capt. Larry DeCelles. I think the point that Mr. Moffett just made ties in with the question Mr. Walker was asking earlier. The answer is fairly simple. Airline income is controlled by the Government setting the price of tickets. So, it is understandable that airlines wanting to make profits would prefer to have any problem solved on the ground at Government expense rather than in the air at the airlines' expense. That just makes sense.

The FAA's reasons for preferring a ground solution are a little less easy to understand. The only thing I have been able to figure out is that there is a possibility of empire-building and empire preservation involved. Certainly I would not want to get into it any more precisely than that, but——

Mr. MOFFETT. What do you mean by that? What do you mean by empire-building?

Captain DECELLES. The solution being proposed for the collision avoidance problem would involve equipment owned by and operated by FAA employees.

Mr. MOFFETT. I see.

Mr. Cotton said that they have switched in midstream from apparently the consideration of one system to another; is that correct?

Mr. COTTON. They were concurrently carrying on development of the two systems, the airborne collision avoidance system and the ground-based collision avoidance system. These are automatic systems that are in addition to the air traffic control system and designed to back it up and supplement it. But, as the ground-based system is so costly and so far off in time, they have been delaying the airborne solution in order to keep from losing the impetus to develop their own ground-based system.

Mr. MOFFETT. What kind of attitude has there been on the part of the airlines and the manufacturers? Have they wanted to avoid having to install this kind of equipment or not?

Mr. COTTON. In fact, it was the airline industry that began the initial work on the airborne system back in the 1960's. However, they are not about to install any system that does not have national standardization. So they are in the position of having to wait for the Government to come up with a national standard before they are going to implement it. Once that is done, I am sure they will implement it.

Mr. MOFFETT. If the Congress required the FAA to do what you want to be done, how long do you think it would realistically take? I'm talking about having it become a reality.

Mr. COTTON. Within a matter of 2 to 3 years we could have it on board and working.

Mr. MOFFETT. Thank you.

Thank you, Mr. Chairman.

Captain O'DONNELL. Mr. Moffett, if I may, you may rest assured that if the Congress doesn't act, we will be back here 5 years from now on the same issue following another disaster.

Mr. MOFFETT. Thank you.

Mr. BURTON. Mr. Hightower?

Mr. HIGHTOWER. Mr. Cotton, you said a moment ago that we are having to depend on visual contact for each being aware of the other's

presence. Now according to the news accounts of yesterday's tragedy, both of the pilots were warned twice and both acknowledged the warning twice of the presence of the other in the area. Are you familiar with that?

Mr. COTTON. I did hear that on the news.

Mr. HIGHTOWER. That would indicate that both were under some common control.

Mr. COTTON. They were both in contact with the same air traffic controller. That is correct.

Mr. HIGHTOWER. What else could have been done or should be done other than to warn them of the approach of another aircraft?

Mr. COTTON. If they were operating under instrument flight rules, they would both be provided positive separation by the same individual. By the assignment of altitude or heading, the controller would have assured that separation would exist.

Mr. HIGHTOWER. Do you mean the controller would have directed each of the pilots to take certain specific actions?

Mr. COTTON. He would have cleared each of them to fly or navigate along a path that was free of the other.

Mr. BURTON. Excuse me, I think what Mr. Hightower is saying is this. They were both coming at each other; is there a procedure to handle that? Are you saying that if they had the right procedure, they would never have been in the same pattern?

Mr. COTTON. That is right.

Mr. HIGHTOWER. Mr. Chairman, if I may, I interpret what he is saying as this. At that point they should have been given some other direction other than just being told or just being warned.

Mr. BURTON. Excuse me, that is what I was asking. Was it at that point that they could have been given instructions, or was it that if they had been following the right procedure, they would have been going down different "streets"?

Mr. COTTON. In the instant case, if there had been a procedure that would have allowed a safety advisory to be issued, then they would have been on separate streets.

Mr. HIGHTOWER. Captain DeCelles, I understood you a moment ago saying something about the fact that you thought certain action was not taken because the FAA employees owned something. What were you saying there? I did not understand that.

Captain DECELLES. Not the FAA employees owning something. The FAA owns the radar and the facilities in the air traffic control system. FAA employees operate that equipment. Their employment stems from the control of air traffic.

Mr. HIGHTOWER. How would you change that? Do you find something wrong in the FAA owning the air traffic control?

Captain DECELLES. I was responding to Mr. Walker's question as to what would be the possible motivation of the FAA in preferring a ground-based system to an air-based system. The only answer I could see—other, of course, than that the ground system would be better, which we do not believe—is that if there were any motivation, it would seem to stem from a vested interest in a ground-based solution.

Mr. HIGHTOWER. Captain O'Donnell?

Captain O'DONNELL. What we are getting at is this. Presently the FAA has roughly 50,000 controllers. They have 80,000 employees. If

they develop a new ground-based air traffic control system, they may need 120,000 employees.

So, there is the bureaucratic followthrough of continuing to build and build. If they put it in the airplane, we won't need 120,000 FAA employees, and this would not be in the bureaucracy's best interest. I think that is what Captain DeCelles is getting at.

Mr. HIGHTOWER. In other words, you think the FAA is trying to build a greater empire by using a certain type of control?

Captain O'DONNELL. Yes.

If I may, let me make one other point. This is in response to the chairman's questions and yours, Mr. Hightower.

The collision avoidance system we have been talking about has instrumentation in the cockpit that would have told the pilot to go up or down. Mr. Cotton, I think, was trying to make that point. We do have systems available today that could have separated these two aircraft.

The aircraft should have perhaps been at different altitudes. That is another way. You can keep them at different altitudes or different "streets," as the chairman said.

We have to be very careful that we don't speculate as to the cause of that accident, but two aircraft should not have been allowed to be in the same area when they didn't have positive control.

Mr. HIGHTOWER. Of course, we don't know what other information was communicated to those pilots at that time because it was a brief news report as to what was said.

I was also interested in Mr. Moffett's question about the multiple use of these facilities and especially having student pilots in an airport area that is heavily used for commercial air traffic.

Would you think it would be much wiser, disregarding the military use, in considering the student training, that this should be done at an airport completely apart from where commercial traffic is?

Mr. COTTON. Mr. Hightower, this is normally the case. Most student instruction is carried on at airports out from the major ones. In this case, the instruction which was taking place, according to the news reports, was in instrument landing procedures. So, in order to carry out this type of instruction, they had to go to an airport where an instrument landing system is available.

The question was apparently not a matter of experience in this case. It was the rules and procedures being applied.

Mr. HIGHTOWER. Captain O'Donnell, I appreciated your entire statement, but I notice that you kept referring to the fact that so much of the certification process is secret and that it needs to be open for comment at every step of the procedure.

Is not this information available under the present law, the Freedom of Information Act?

Captain O'DONNELL. No, Mr. Chairman, it is not. The FAA and the manufacturers describe the information we are seeking as proprietary data and contend that foreign manufacturers could obtain it and get a competitive edge on some of our airliners. A lot of our material was information not available readily to anybody. We have petitioned the FAA on several occasions for information and have been denied it under the so-called proprietary rule. We finally went to court to get

the information and finally did get it. We looked at it, and we were stunned because we could find nothing in there that could be considered proprietary.

Mr. HIGHTOWER. Has the FAA ever published a concise definition of what is proprietary data?

Captain O'DONNELL. I don't believe so.

Mr. HIGHTOWER. So, anything can be called proprietary and withdrawn from availability under the Freedom of Information Act as far as FAA is concerned?

Captain O'DONNELL. The evidence that we found in having to go to court under the Freedom of Information Act to get information on certification of the earlier aircraft, clearly showed us that they hide things under the guise of proprietary information.

Mr. HIGHTOWER. Would you agree, though, that there might be some legitimate proprietary information that would be available to FAA by the manufacturer in the certification process?

Mr. O'BRIEN. There is no question that there may be proprietary information made available to the FAA during the certification process. There are different reasons for proprietariness.

Basically, it is the manufacturer who notifies the FAA that it considers a certain package of data proprietary.

Mr. HIGHTOWER. At that point, Mr. O'Brien, are you saying that the manufacturer is the one who determines the proprietary nature of the information?

Mr. O'BRIEN. The FAA must be notified by the manufacturer as to what information he considers to be proprietary.

Mr. HIGHTOWER. The FAA is either bound by law or considers itself bound to honor the proprietary designation?

Mr. O'BRIEN. That is correct.

Mr. HIGHTOWER. Is it bound by law?

Mr. O'BRIEN. I am not sure it is bound by law. I would have to check into the specific regulations on that, but I would have to assume that in those cases there is some kind of statute available to protect the manufacturer. I would assume this.

Mr. BURTON. That is a question we could ask Mr. Bond on Thursday of this week. I think Mr. Hightower raises a good point. If the manufacturer says such-and-such is proprietary information and if FAA agrees, then that might be the end of it.

Mr. HIGHTOWER. Mr. Melvin?

Captain MELVIN. A lot of the proprietariness occurs after an accident. At this time we feel that many, many times there is litigation involving accidents, of course. The Federal Government and the FAA are parties to the suit.

As to the proprietary question, we suspect that many times there is a reluctance to disclose how the certification process is actually done. We have had our meetings on regulations. We know what the regulations read, but we do not know what actually happened when the particular thing was certified.

This is where the FAA does not always monitor itself. It does not have a centralized certification process. Each region does its own certification. So, when manufacturer A goes to its region and it gets some kind of sweet deal on a particular interpretation of the regulations,

then that is proprietary because it doesn't want its competition to know about it.

As soon as the competition——

Mr. HIGHTOWER. Are you saying that does happen or is it theory?

Captain MELVIN. It does happen. That is proprietary. When manufacturer B finds out about it and if it can put more passengers on the airplane or something, then it wants the same sweet deal. They go to their certifying region and they say, "Well, they let so-and-so get away with it. Why can't we do it?"

This is the way the certifying process has eroded over the years.

Mr. O'BRIEN. I think we have a specific case in the submissions that we made for the record. It will describe in detail what Captain Melvin is bringing out.

It was with respect to the CF–6 engine. You had a new system come along, a new engine. The FAA was not ready to certificate that engine by its own criteria because the technology had surpassed the criteria that were available in the certification process. So the equipment was certificated under old or outdated criteria.

Now, a competing manufacturer comes along with a similar new engine. In the meantime, the FAA criteria have caught up to this new technology. The second manufacturer says, "Well, I want my piece of equipment certificated under the old criteria because if you apply the new criteria to me, it is an unfair economic advantage to the first man."

So, the FAA finds itself in trying to promote safety but also charged with the economic well-being of the industry in general.

Mr. BURTON. Excuse me. Where in their charter are they charged with the economic well-being of the industry? I thought that was the CAB's responsibility.

Mr. O'BRIEN. Let me back up on that. The FAA is charged with the well-being of the industry and it is under the act, but it does not say economic well-being.

Captain O'DONNELL. It is charged with promoting the industry.

Mr. HIGHTOWER. Thank you, Mr. Chairman.

Mr. BURTON. Mr. Evans?

Mr. EVANS. I have no questions.

Mr. BURTON. Mr. English?

Mr. ENGLISH. Thank you, Mr. Chairman.

First of all, I would like to get back to a point that Mr. Hightower made. I would like to preface my questioning by stating that I strongly support the collision avoidance systems that you are requesting. I think they are certainly necessary, and it is a step that should be taken as soon as possible.

However, given the situation we had yesterday and given the remarks that you have made with regard to Mr. Hightower's questions, it would appear to me that the only answer to the problem that we had yesterday, or the disaster that we had yesterday, was one of human error once again. Either the air traffic controller did not assign the right altitudes, or one of the two pilots was not following that altitude.

Would you agree with that conclusion?

Mr. O'BRIEN. I cannot agree with any conclusion concerning that accident, but I would like to make an observation concerning midair collisions in general.

As someone pointed out earlier, the FAA came into being because of a midair collision. In 1970, the NTSB published a report on a proceeding it had into the midair collision problem. There are several recommendations in this report. One of them was strongly recommending that we have a collision avoidance system. In course, the industry in general supported this.

Again, without getting into a specific aspect of any recent accident, there is an appendix No. 3 to this report that talks about the see-and-be-seen concept. It says it was outmoded in 1956 when we had our first major midair collision. The NTSB goes on to make specific recommendations about see-and-be-seen concepts, and we have had several questions concerning advisories and whether who saw someone else or something like this. That whole concept is outdated. There is a series of midair collisions in here where both pilots saw each other, and the collisions still occurred for many different reasons.

I think I would like to submit this report for the record. It is quite interesting reading.

Mr. BURTON. Without objection, the report referred to by Mr. O'Brien will be kept for the record.

[The report entitled "Midair Collisions in U.S. Civil Aviation, 1969–70," adopted June 7, 1972, is in the subcommittee files.]

Mr. ENGLISH. You still come back to that one basic point with regard to this particular situation. You must say on the part of one of three people there was human error involved. You have already stated that the procedure was there for the traffic controller to use; namely, to assign different altitudes and different flightpaths, or one of those two pilots did not follow that flightpath. It has to be an error in one of those three places.

Mr. BURTON. If the gentleman will yield on that, we are going to hear from the National Transportation Safety Board later and also FAA on Thursday.

I think at this time all we know are the newspaper reports.

Mr. ENGLISH. Mr. Chairman, I am not discussing specifically what happened in this particular case. However, all morning we have been using this as an example. We have heard testimony this morning that in this particular case such-and-such procedures are followed.

Mr. BURTON. I see. Go right ahead.

Mr. ENGLISH. You have an air traffic controller; whenever he sees two aircraft coming into the same airspace, then he has the responsibility to assign them altitudes. He has the responsibility of following them on the radar screen and notifying them if one of the two, or perhaps both, are not following the altitudes. They have the responsibility of carrying that out.

That is what I am trying to get at, Mr. Chairman.

Mr. O'BRIEN. Let me state that none of these comments should be taken with respect to a specific accident. Let me make a general statement on some philosophy.

Then Mr. Cotton may give you some specifics as to air traffic control procedures.

You were referring to human error in a general context. We have recommended to FAA that it undertake a special investigation in its R. & D. efforts to investigate human performance and human

error, not specifically in pilot performance or air traffic control, but in general.

We think this whole situation of human error—whatever it is—is in need of investigation and in need of further detail. We have made specific recommendations on that.

Also, a number of these certification cases that we present to you have a theme of human error within them. Whether it is crew workload, or air traffic control procedures, or human error made on the part of an engineer representative—the theme runs throughout all the cases that we have presented.

Again, we think there are specific changes that can be made through the certification process to treat the problem in a much more proficient manner than it is being treated today. I am not talking just about airplanes. We are talking about the systems in those airplanes. We are talking about the ground systems that are used to control the airplanes.

Mr. ENGLISH. That is exactly what I am getting at. That is the point I am trying to make. Anytime that you have human beings involved, there is going to be human error.

Certainly the more complicated the air traffic system is and the more people we have flying, and the more airplanes we have up there, the more difficult it becomes to manage, and the more likelihood there is of human error. This is the reason that I think that one of the best points in favor of the collision avoidance system is this situation. I think they must be installed. This is what it all comes down to. I am talking about the human factor. Anytime that can be reduced insofar as the likelihood of error is concerned, or anytime there is a backup system that can be provided to warn when there may be a human error, I think it justifies the cost to take that step.

There is one other point that I would like to make. This has to do with the automatic landing system that you have testified about. We have had, over the years, quite a bit of testimony in numerous hearings with regard to the procurement practices of the FAA. We have had a great deal of difficulty with regard to procurement insofar as the FAA is concerned. In one particular case that I know of which this committee has followed ever since I have been in Congress has to do with the training simulators for air traffic controllers. This is something that the Congress funded back in 1971. We still do not have them. In fact, I think the date they are supposedly going to be delivered now is some time in 1980. It is going to be 10 years since we authorized those training simulators. We have had a situation insofar as the training of our air traffic controllers that is absurd.

We have brought out numerous problems with the procurement practices of FAA.

I was wondering if you would care to address yourselves to those particular difficulties.

Captain O'DONNELL. I would like to touch on two parts of that, if I may.

First, with respect to your last comments. As you are aware, I am sure, the airline pilots have been fighting for over 10 years with the FAA to try to get the simulators for the air traffic controllers because we think the training should be done on the ground and not with live aircraft in the air.

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We have had numerous meetings with the Professional Air Traffic Controllers Organization because we support its efforts to try to get the simulators. The FAA, in its normal, lethargic way of doing business, is dragging its feet. We should have had the simulators 8 years ago.

The first statement you made before you got to the last one was dear and near to my heart. We attempted to get the FAA in March of 1977, when Dr. McLucas was Administrator, to do an in-house study or compilation of all the human factors in workloads. Studies have been done around the country.

We have a change of administration and we lost a very competent professional in Dr. McLucas. We reverted back to politics for Administrators in the FAA. As a result, no action was taken by the FAA. It did a phony in-house study to supposedly study the human factors and biomedical studies that had been done in the past, which they didn't do.

We saw that the FAA was dragging its feet and not doing anything. As a result, the Air Line Pilots Association invited the entire professional scientific community in this country to come to Washington in the building right next to the FAA—the only way we could get the FAA to show up at it—and had these scientists put on a symposium about workload and man's limitations. That symposium study will be done in several weeks. I was very impressed with your knowledge and your questioning on it, and I would like to submit, with the chairman's permission, that symposium study to the subcommittee. I think it is very appropriate to what you have just addressed. It is a shame that we had to do it, and the FAA did not do it.

We will not let it lie. We will pursue it.

Mr. ENGLISH. Keep it in mind that even if we are successful in getting the FAA to yield to these types of studies and recognize the need, and to even make the decisions to take the step to make those types of procurements and make those types of rulings that are necessary to provide these types of backup systems, then we still have the problem of procurement. It is one that has been with us for numerous years in the FAA. To my knowledge it still has not changed. There has been no indication that it is going to change.

Captain O'DONNELL. I think it has gotten worse in the last several years.

Mr. ENGLISH. I would have a tendency to agree with you.

So, we are faced not only with a decision—and perhaps Congress could deal with this—but we are faced on the other hand with a second problem of procurement. We may be faced with a decision being made but it may be 10, 15, or 20 years before it is ever implemented. This is the problem I see.

Captain O'DONNELL. Let's talk about 35 years. Thirty-five years ago they invented the ILS system, and we cannot get them procured. The money is in the trust fund. I am not even sure that FAA takes direction from the Congress any more.

Mr. ENGLISH. There have been some indications that may be true.

Thank you, Mr. Chairman.

Mr. BURTON. Could you make a brief comment on that, which will have to be the subject matter of another hearing, I suppose: General aviation utilizing major airports such as Los Angeles International or San Diego.

What is the solution, if any, to that problem?

For anyone who is in here from the general aviation community, we are going to have hearings in the future on that matter. So, don't get too nervous. I wanted to take this opportunity to raise that issue.

Captain O'DONNELL. There is no question in our minds that general aviation has a role in this country. It is a vital role. I have found very little reluctance on the part of the general aviation people that I know in not buying the equipment to be part of the system.

There are very few aircraft that do not have the capability of coming into the mainstream of ATC. We would gladly participate in future hearings that you would have on that. We see general aviation as a major part of the air transportation system in this country.

Mr. COTTON. Mr. Chairman, I would like to point out that in addition to flying 727's, I also fly Super Cubs, tow gliders and fly in gliders. I enjoy all kinds of aviation. I have not tried hang gliders yet.

But I would like to point out that the size of an airplane is not a factor in the hazard presented. It is the rules under which it operates and the equipment it has on board.

To segregate the use of public airport facilities based on the size of aircraft would be wrong.

Mr. BURTON. How about segregation based on the equipment provided on board? I could see where some private airplanes would not have this equipment. Certainly Frank Sinatra could put any kind of equipment on his aircraft, but somebody else might not be able to. It could be a costly item.

Mr. COTTON. Certainly. But what we are talking about is this. At the major airports we have what are called terminal control areas. They require that certain equipment be carried on board any aircraft that operates in those airports. The communications and navigation equipment and the transponder that I talked about before have to be there. That is the critical element in the working of a collision avoidance system. That is the transponder.

Mr. BURTON. Both planes, I believe, had transponders yesterday.

Mr. COTTON. That may be so.

As long as every aircraft that is using this particular airspace that we are talking about is equipped with these central elements, then we see no particular hazard presented by the class of aviation.

Mr. O'BRIEN. Let me follow up with a brief comment. He talked about the transponder being an important ingredient.

Some time ago, because of the midair problem and because of other problems. there were procedures and regulations passed requiring transponders to operate in certain areas. There was general outcry from the general aviation type of people—which I am one of as well as Mr. Cotton—saying that the FAA was requiring an additional expense. There are a lot of people who believe in freedom of travel.

However, an interesting thing happened. As soon as transponders became mass produced and as soon as the people started buying them, the prices took a drastic drop. You can pick up a transponder for less than $1,000. This is not any undue hardship for a person who wants to navigate under IFR conditions in dense traffic situations.

So, I think the things we are talking about here get back to the heart of the question that you raised earlier, Mr. Chairman. It is not the size

but the equipment that you have in the airplane and whether you are willing to pay for the equipment.

Mr. BURTON. Thank you.

Mr. Butterworth?

Mr. BUTTERWORTH. Thank you, Mr. Chairman. I will try to be brief, but there are some questions we should have answered for the record.

Whatever the collision avoidance system is, whether ground-based or airborne, it must provide the pilot with an independent means of deciding what the conflict is within his immediate proximity, whether he is in a high- or a low-density area; is that right?

Mr. O'BRIEN. That is correct.

Mr. BUTTERWORTH. You are unhappy with the recent change FAA made from a trimodal BCAS to a concept linking active-only BCAS with DABS, the reason being that passive BCAS was cheap enough to be equipped on general aviation aircraft, and that speaks directly to the point Mr.O'Brien just made. Is this also true?

Mr. COTTON. Not quite. The reason is that the type of BCAS that is now being pursued in the near term will not operate in the high-density air spaces.

Mr. BUTTERWORTH. There are a couple of important questions here. Perhaps there are two types of data which generated during the certification process. One type would be performance data. The other would be data on the intricate details of a system.

Would ALPA be satisfied if, as a designated interested party, it saw only performance data. or would ALPA require to see the intricate insides of the particular black box, or wing assembly, or something of that sort?

Mr. O'BRIEN. If ALPA were to gain access to the certification process as a designated interested party, we would be very interested in certain aspects of the certification based on our operational experience. These are things we have experienced in real line operations. So, we would concentrate on those areas first in the certification process, and we would be interested in those areas to the minute detail.

Mr. BUTTERWORTH. You would not be able to draw a line right now, could you?

Mr. O'BRIEN. No; because one of the case studies has gone into minute detail. We talked to the subcontractors involved in a particular system as well as the major component.

Again, we fought for over 4 years to gain access to what was called proprietary information. In fact, as it turned out, the FAA had insisted that they would not be able to make the information available to us on that system because the information was proprietary. Boeing had the only information on the system.

Yet, it was this proprietary information that was the sole source of the rationale behind the determination on the certification and safety of this particular piece of equipment.

Mr. BUTTERWORTH. Thank you. I wanted to get that on the record.

Another thing we need for the record is this. Captain O'Donnell's recommendations for where ALPA or other parties could gain access to the certification process differed a little bit from what we had discussed previously in some staff meetings.

Previously we had agreed that one acceptable solution to ALPA would be to have a designated interested representative at all type certification board meetings, at all specialists' meetings, with the option—not the mandatory requirement—but the option of calling a public hearing after the final type certification board meeting and before the type certificate is signed, if there is an outstanding safety issue. Is this no longer an acceptable alternative?

Mr. O'BRIEN. We started with a basic position on this in our prepared statement. We have alternatives to the proposal that has been discussed, as you have pointed out.

I think there is probably a great amount of examination which needs to be gone into as far as the process is concerned itself.

Also, insofar as how to do it effectively, if the process is opened up, a designated interested party could participate.

Mr. BUTTERWORTH. But you would not rule this out, would you?

Mr. O'BRIEN. We would not want to rule any possibility out right now. We had discussed internally various means of participating in the process effectively. We have a submission that goes into this subject in more detail. We could take up more time on this now, if you want.

Mr. BURTON. You have that submitted for the record, and we will deal with that.

Mr. BUTTERWORTH. Your statement in your submission is that the CF–6 General Electric engine was certified under "old" standards. There were a couple of advisory circulars involved here. Which advisory circular was the old standard the CF–6 was certificated against?

Mr. O'BRIEN. I would have to go back and check the statement here in detail. It gives the exact advisory circular number. The scenario goes something like this.

The Pratt & Whitney JT9D engine was certificated under then-existing criteria. Because of operational experience and because of the situation that was run into during the certification process of the Pratt & Whitney engine, the FAA developed revised criteria for high-bypass-ratio jet engines.

Now, these revised criteria were in draft form when General Electric applied for its certification. The decision that had to be made internally within FAA was, would they, in fact, apply their draft criteria to the new engine?

Let me state one more thing on this. In past certification situations, it has sometimes been beneficial for the manufacturer or the airline to have draft criteria applied to its new system and new technology. We have documented cases where airlines and manufacturers have requested a draft criteria to be applied because it is beneficial and takes advantage of the latest technology.

Mr. BUTTERWORTH. Thank you.

I have one last question on the fail-passive autoland system. Again, we need some comment from you in order to set the stage for other witnesses.

I would like you to describe in graphic, yet still brief terms the kinds of decisions, or the "decision envelope," that a pilot would encounter landing in 700 RVR visibility conditions at or below a 50-

foot decision height if he has to (1) manually make the approach; (2) assist the fail-passive autoland system in making the approach; or (3) manually execute a go-round.

How does your view of this "decision envelope" affect your consideration of the assumptions made at Boeing, for example?

Captain DeCelles. I would like to answer that question.

In the first place, I think it is important to understand that the authorization for use of fail passive automatic landing systems is to use them to a visibility condition described as 700 feet runway visible range, or RVR. The 700 RVR means the distance at which you would be able to see a 2,000-candlepower light through the fog. These lights in this room are probably not too far different from 2,000-candlepower lights.

So, when you consider that the airplane is approaching the runway at a speed somewhere between 200 feet and 250 feet per second, and the pilot is only going to be able to see a very, very bright light 700 feet ahead of him, that means that he is going to be over that light in somewhere between 2 and 3 seconds from the time he can first see it.

It is on the basis of that ability to see that it is proposed that we should verify the performance of the automatic landing system in getting us down to the 50-foot point and also to ascertain that continued operation of the system would land us on the runway.

It is also very important to realize that the runway is only 150 feet wide.

Another thing to keep in mind is the fact that from approximately the 50-foot point on down, the automatic landing system is not allowed to bank the airplane. There is no rudder control involved so you are a ballistic missile from that point on.

The pilot has to make a decision in that 50 feet. I should also say this: Until he reaches a height of about 70 feet, he is probably not going to see anything.

Between 70 feet and 50 feet is a matter of about 2 seconds at the most, and he has got to see enough to make this decision. We do not think that it is possible.

We certainly know that it is not possible to make any decision about the vertical progress of the airplane. We are not driving a Greyhound bus. We do not only have to be concerned with being somewhere near the center of the runway, but we also have to be concerned that we do not land too far down or too far short.

We have to make the decision at 50 feet either to allow the automatic landing system to continue the approach or to initiate a missed approach. If we initiate a missed approach, then if we decide instantly at 50 feet—and if we do everything exactly right—then we probably won't touch the ground during the missed approach.

Mr. Butterworth. How close would you get to it?

Captain DeCelles. Probably 30 feet.

Mr. Butterworth. What do you see at that point?

Captain DeCelles. Probably three or four runway edge lights at the most.

Captain O'Donnell. You have your nose in the air, of course.

Captain DeCelles. Yes; everything vanishes instantly.

Now you have to go back down to your head-down instrument panel and control the go-around procedure.

Mr. BUTTERWORTH. How long is that transition time?

Captain DECELLES. To be fair, you can pull back on the wheel as you are looking down so it is not a total——

Mr. BUTTERWORTH. But there is some visual——

Captain DECELLES. There is some period of time involved to go from looking out the window where you have to be looking at the decision light, and you look back down, but when you look back down, you don't just instaneously get back into instrument information loop. It takes a period of time to become oriented by your instruments because they are not all that pictorial.

If, on the other hand, we decide to continue the approach, and at any time after 50 feet this system disconnects—and this is the thing that is unique about the fail passive automatic landing system, that is, that it is liable to disconnect and, in fact, very liable to disconnect, and particularly at the point where the flare should initiate—and it could disconnect because of some disagreement between the two radio altimeter sources. If there is a disagreement, the system will disconnect itself, and you get a horn that says, "You got it buddy." You have a decision to make. You may be at 30 feet when the horn comes on, and then you have to decide very quickly if you are going to go around or if you are going to continue the landing manually.

A decision like that, strangely enough, takes 2 or 3 seconds. At the end of those 2 or 3 seconds, you are virtually on the ground.

The FAA and the manufacturers say that this is no problem because the worst that can happen is a hard landing. However, I happened to be behind an airplane that made such a hard landing at Los Angeles one night, and it burned up in the fog. Fortunately, all the passengers got out.

So, I cannot buy the idea that the worst that can happen is a hard landing.

Mr. BUTTERWORTH. Your general philosophy is that that kind of decision envelope with that speed and those visibility conditions constitutes a very hostile environment for any pilot.

Captain DECELLES. Extremely.

Mr. BUTTERWORTH. You are, in effect, saying to the manufacturer, and the FAA, and the companies: "Do not send us down into those conditions unless we have a truly fail operational system which will land us, flare us, and do everything automatically for us, all the way down."

Captain DECELLES. Or give us the information to accomplish those things manually if we are required to. We are not opposed to doing this with a fail passive automatic landing system subject to disconnect, but when we run into that eventuality, we need guidance information that will enable us to perform the tasks that we will be required to perform.

We asked the FAA when they announced the system: "How did you determine that the pilot is going to be able to accomplish the tasks that this will require of him in the emergency situation with the tools that he is proposed to be provided with by this system?"

They said: "Well, we required the manufacturer to provide us with data substantiating safe go-around characteristics and a high reliability of landing success."

So, we said, "Let's see the data." Here is the question of certification and rulemaking.

The FAA said that they could not let us see the data because it was proprietary.

So, we went to the manufacturer of the aircraft and asked if they regarded it as proprietary, and they said they did, but that they would talk to us about it.

Mr. BUTTERWORTH. They did show you the data?

Captain DECELLES. Well, I will let Mr. O'Brien answer that because we sent him out to look at the data.

Mr. O'BRIEN. The meeting that took place at Boeing was after several requests to have a chance to look at this data. After two aborted attempts, Captain DeCelles and several members of the All-Weather Flying Committee had visited Boeing earlier this year with the intention of examining the data. However, at that time the data were not available for whatever reason.

So, we made another attempt to look at the data, and they told us they could meet with us for 1 day to discuss the data. We arrived in Seattle and met with Boeing people. We went into this office at about 10 o'clock in the morning and there was a table about twice the length that we have here this morning. It was covered with very large volumes of data about a foot high.

We were asked if we would like to examine the data at the time it was available, or if we would like to sit down and discuss the data. The Boeing personnel were to leave at 4 o'clock.

We asked them if they had any kind of summary of the data that we could have. They said there wasn't anything like that available. We then picked up a few of the volumes and started leafing through them. It was page after page of something like you saw earlier here—charts with graphs on them. Sure, we could examine that in some detail if we had the time and if they would make it available. But, of course, they wouldn't.

So, we discussed all of the data in some detail with the Boeing engineers who were available and some of their flight test personnel. We had a specific list of 56 questions on the data that were supposedly provided to FAA. We went through each one of those questions with these Boeing representatives, and we have a written report based on our meeting with Boeing. A draft of this report has been made available to the staff of the committee and it covers in some detail what areas still remain in our minds as concerns after questioning the Boeing people on these 56 areas.

From that concern, we have noted that most of the data contained in those reports are based upon certain assumptions that were made. These data are absolutely useless unless these assumptions are valid.

For example, one of the assumptions that——

Captain DECELLES. There are five assumptions that we have determined. I would like to read them.

The first assumption is that all go-arounds will be successful regardless of the height at which they are initiated.

Mr. BUTTERWORTH. Based on operational experience, is that a logical assumption?

Captain DECELLES. I would have to say that we finally prevailed upon the FAA several years ago to run some tests in a series of simu-

lators around the country to determine how much height loss will occur after a pilot decides to initiate a go-around. It would certainly not indicate——

Mr. BUTTERWORTH. What happened to that study?

Mr. O'BRIEN. That study in itself is a very interesting story. We had to make some clandestine visits to some people in Oklahoma City to get access to that data. Again, we can supply that information on that particular study. It is called a category 2 height loss study. It was stimulated by ALPA. It was conducted by some people not within FAA headquarters. It was conducted by some of the regional people.

They visited several airlines and collected actual data from aircraft simulators and aircraft themselves.

Mr. BURTON. In other words, the study has not been made public?

Mr. O'BRIEN. It has been made public, yes. But it was made public about 2½ years after the thing was actually conducted and only after repeated requests from ALPA to gain access to the report. We had a draft of the report, and I think that was the only reason it was made public.

Mr. BURTON. That study would indicate that there was some question about the validity of that assumption?

Captain DECELLES. Absolutely.

The second assumption was that the hard landing would be the worst effect of a failure to flare or inadvertent ground contact during the go-around. That, as I indicated earlier, certainly doesn't hold water.

The third assumption was that it is extremely improbable that a catastrophe would result from a decision to land manually after a malfunction of the autoland system below 50 feet with 700 feet RVR.

The fourth assumption was that conventional instrumentation and/or external visual reference in these conditions is sufficient for assessment of the flare.

The last of these assumptions was this. This is the most incredible of all, it seems to me. It says that when calculating the system reliability, it is not necessary to consider the probability that a system malfunction will occur below the 50-foot decision point.

Mr. BURTON. Would you repeat that?

Captain DECELLES. When calculating system reliability, it is not necessary to consider the probability that a system malfunction will occur below the 50-foot decision height.

Mr. BURTON. Is there any justification or rationale for that, or is that a statement of fact?

Captain DECELLES. There, again, some of these assumptions are intertwined. The assumption is made that there is a twofold assumption involved there. One is that you would not go below 50 feet if you did not have adequate visual reference to control the airplane manually in case of disconnect. Or, that you would always be able to go around no matter at what altitude the disconnect occurred.

You understand this system will disconnect itself if it has any kind of problems, as opposed to the fail operational systems that are on the DC–10 and Lockheed L–1011 which are guaranteed by design to stay on until touchdown.

Mr. BURTON. The assumption says there will not be a breakdown below the 50-foot decision height? It does not say that, even if there

is a breakdown, that you can go around but it just says that there is no probability of breakdown; is that right?

Captain DeCelles. It implies that if there is a breakdown——

Mr. Burton. What does it say? Give me the statement one more time.

Captain DeCelles. When calculating system reliability, it is not necessary to consider the probability that a system malfunction will occur below the 50-foot decision height.

Mr. Burton. You will be able to deal with it, therefore it does not matter.

Captain DeCelles. Right. But they did find it necessary to calculate the probability that a malfunction would occur between the 100-foot height and the 50-foot height, which is the less critical of the two zones.

Mr. Butterworth. Did Boeing pilots, in actual aircraft or in simulators, execute any missed approaches below 50 feet?

Mr. O'Brien. Not in those visibility conditions.

Mr. Butterworth. So, therefore, the only available operation experience tells you that the assumption is erroneous. That is, unless there is something particularly great about what that system gives you in making a missed approach, they must conduct comprehensive testing to make that assumption. Is that right?

Mr. O'Brien. You have to remember these assumptions are made so that the data supplied in those volumes I described will be accurate. Without those assumptions, the data that were collected are not valid.

Captain DeCelles. I might add to this in this way. For 10 years our committee has been pleading with the FAA to conduct a scientific study to find out what a pilot needs to be able to see in order to control the airplane manually. We finally succeeded several years ago in getting a program started along those lines. As soon as it began to bear fruit and bear out our suspicions, the program was canceled.

Mr. Butterworth. There are a lot of accidents during low visibility approaches. In fact, you might say that there are more fatalities caused by this particular kind of accident than there are by mid-air collisions. Is that right?

Captain DeCelles. At least 50 percent of all people killed in airplanes are killed during low visibility approaches.

Mr. O'Brien. It is even more dramatic than that. If you look at approach and landing accidents, that is where 90 percent of the fatalities have occurred. This is one of the reasons why more emphasis has not been given to the mid-air collision situation.

Mr. Butterworth. So that suggests a great deal of caution on the part of the FAA and the manufacturer when developing any system that brings the pilot into even lower visibility conditions; is that right?

Captain DeCelles. Yes.

Mr. Butterworth. Thank you, Mr. Chairman.

Mr. Burton. If there are no further questions of these gentlemen, we want to thank you for your testimony.

Our next witness will be Elwood T. Driver, Acting Chairman, National Transportation Safety Board.

Mr. Driver, will you please proceed?

STATEMENT OF ELWOOD T. DRIVER, ACTING CHAIRMAN, NATIONAL TRANSPORTATION SAFETY BOARD; ACCOMPANIED BY MARTYN V. CLARKE, DIRECTOR, BUREAU OF TECHNOLOGY; WILLIAM G. LAYNOR, CHIEF, VEHICLE FACTORS DIVISION, BUREAU OF TECHNOLOGY; AND FRITZ L. PULS, GENERAL COUNSEL

Mr. DRIVER. Thank you, Mr. Chairman.

I am Elwood T. Driver, Acting Chairman of the National Transportation Safety Board. With me, to my right and left, are Martyn V. Clarke, who is the Director of the Bureau of Technology of the NTSB. Mr. Clarke heads the unit within the Safety Board which provides the technical specialists for active investigation and special studies effort. He has been with us since its inception and with the predecessor agency for 16 years, all of these in the field of transportation safety.

To my immediate left is Bud Laynor, who is the Chief of the Vehicle Factors Division of the Bureau of Technology. He is an aerospace engineer and a former Navy pilot. He heads the division which investigates the airworthiness aspects of aircraft involved in our accident investigations.

To my far left is Fritz Puls. Mr. Puls has been General Counsel of the Safety Board since 1967 and, prior to that, the Federal Aviation Administration for 18 years. He has spent all of that time in the field of transportation safety laws and regulations.

I have been a pilot for almost 40 years and have been involved in both civilian and military aircraft. I have been very active in the safety field for over 30 years. I have been with the Board since March and prior to that time, I was 11 years with the National Highway Traffic Safety Administration.

Mr. BURTON. Let me congratulate you on a very detailed statement. We had an advanced draft of it in time to digest it. I hope that you could submit that for the record and that you could summarize. If you could, I would like to ask you some questions concerning yesterday's accident. Maybe you could provide us information if you have the answers to these questions now and you could give them to us. If not, you could submit them later in writing.

Without objection, we will insert your entire prepared statement into the record.

[See pp. 134–145.]

Mr. BURTON. Do you know if the general aviation aircraft had a transponder aboard, and if so, what type?

Mr. DRIVER. With your permission, Mr. Chairman, I would like to give you a brief summary of what we know about the accident.

Mr. BURTON. All right; that will be fine.

Mr. DRIVER. A member of my staff has just stepped out to see if we have any additional detailed information. What I am about to give you is as of 8:15 this morning when I left the office.

The accident involved two aircraft. One was PSA Flight 182, tail No. 9533PS. He was out of Sacramento to LAX Los Angeles with final destination San Diego. The pilot's name was Capt. James E. McFeron and there were 133 people aboard. Twenty-five of these

were PSA employees. They were deadheading—an inappropriate term at this time—which means they were flying on their own time.

The other aircraft was a Cessna 172 NAN7711G. There were two people aboard this aircraft. One was an instructor. His name was Martin B. Kazy, Jr. The other was David L. Boswell, who was a student. Both the pilots had commercial tickets. Mr. Kazy was giving Mr. Boswell instructions on instrument landing approaches.

The C–172 was out of Gibbs Flying Service at Montgomery Field, and as I indicated before, it was IFR training. Both pilots were rated with commercial tickets.

The PSA aircraft 727 was making a visual approach from the north. Mr. Chairman, I would like to give you some diagrams from the field so that you can follow the routes of the aircraft.

May I invite your attention to the plate that depicts the runway which had 11–1 up on the center top of the page?

The PSA aircraft was making a visual approach from the north in the top of the page, and was turning right toward runway 27, the main runway, which is 9,400 feet long.

The Cessna, which was equipped with a transponder, as was the PSA aircraft, and also equipped with incoding altitude indication, had been making the ILS approach to runway 9, which is directly opposite.

It was making a missed approach practice which means that he made an approach under IFR conditions and we assume he could not make it and had to take off again, much like the previous witnesses were talking about.

He had been cleared to climb VFR on a heading of 070. Get the picture of the Cessna on heading of 070 climbing and the PSA aircraft was making a right turn approach at runway 27 which is almost 180 degrees opposite.

The Cessna had been advised to maintain VFR below 3,500. The crash occurred about 3 miles off the end of the runway over the populated district. It appears as if the Cessna was climbing upward into the PSA aircraft. It was about 3,000 feet. We have no information, concrete information, as to definite cause except that perhaps I could give you some description of the two aircraft.

The Cessna is a high-wing aircraft which might make visibility a little difficult on top. The Boeing 727, of course, is a low-wing type.

After the crash occurred, our people who were out there, incidentally, on the scene within about 45 minutes—that is our Los Angeles investigators—and eventually recovered both of the recorders. I am talking about the cockpit voice recorder and the flight data recorder. They are now back in Washington, D.C. They are undergoing an analysis which will take a matter of a few days to record the raw data. It will take further time to analyze it.

As we understand it, the PSA aircraft at the time of the accident was on—first of all, the air controllers frequency which is out of Miramar—he then turned to tower frequency to make his approach. The Cessna was being controlled out of Miramar by the controller at that place on the AC—approach control—frequency.

The conflict alert system at Miramar was activated. By this I mean the controllers at Miramar noticed the two blips flashing which meant that something was wrong and that there may be a collision.

Miramar asked the Cessna if he had traffic in sight. We do not know at this time what the response was. We might be able to get that back from the tapes.

The PSA at this time was on tower frequency. It appears that the Cessna was on the AC frequency out of Miramar. These are two separate frequencies.

We do not know for sure what type of coordination there was at the time of the accident between the tower at Miramar and the controllers.

As I indicated before, our team which is charged with the responsibility of investigating these accidents, dispatched a team of seven experts from Washington, D.C. last night and they were in place yesterday evening in San Diego.

Let me give you an idea of the type of people who were sent.

We have specialists and assistant specialists in powerplants, operations, air traffic control, and human factors. At that time when they arrived there were also three additional specialists from Los Angeles. These people are active in the field and are going through the remains of the bodies and the aircraft. I have been involved in that many times in my experience. It is not exactly a nice sight.

There are participating parties who will assist us in our investigation and, with your permission, I will give you an idea of who they will be. They are FAA, PSA, PATCO, the air traffic control people, the Aircraft Owners & Pilots Association, the Southwest Pilots Association, the Southwest Flight Attendants Association, and representatives from Cessna, Boeing, and ALPA who will have one observer. That will be Captain Keenen whom I know very well. In a nutshell, that is what has happened in the accident.

The steps we are taking are that our team is in place, and we will be there until we complete the acquisition of data. At that time we will come back to Washington, D.C., and try to analyze that data.

Mr. BURTON. We will appreciate when you have it analyzed having a copy of it.

Mr. DRIVER. We will be glad to do that.

Mr. BURTON. Without objection, the record will remain open for the purpose of inserting this information upon its completion.

[Material will be contained in the NTSB's formal accident investigation report.]

Mr. BURTON. Do you know what type of transponder the small plane had?

Mr. DRIVER. I don't know the name of it, but it was the type that has been approved by FAA. This one did have the encoding capability. It did have an altitude encoder.

Mr. BURTON. Do you know what the nature of the airspace was? Was it a terminal control area or a terminal radar service area? Was there a lot of heavy traffic?

Mr. DRIVER. I do not have that information.

Mr. BURTON. Were traffic advisories issued and acknowledged?

Mr. DRIVER. Advisories were issued. The only information we have is that the Cessna was given——

Mr. BURTON. We know one was issued to the Cessna, but how about the PSA aircraft?

Mr. DRIVER. We don't have that information yet.

Mr. BURTON. How would Miramar notice the problem? At that time PSA was under the control tower. Could Miramar have contacted PSA by any means, notwithstanding the fact that PSA was then under control of the control tower?

Mr. DRIVER. At Miramar the controllers could see both the aircraft on the scope.

Mr. BURTON. Yes, and they contacted Cessna, but did they contact the PSA?

Mr. DRIVER. They could not have contacted PSA at that time because of the control tower frequency.

Mr. BURTON. There is no way they can break in on an emergency frequency and say something?

Mr. DRIVER. Through the tower. It would take a few seconds.

Mr. BURTON. They cannot do it directly?

Mr. DRIVER. No.

Mr. BURTON. Did they convey that to the tower?

Mr. DRIVER. We don't have that information either.

We are getting those tapes. Once we get those tapes, we will be able to give you the information.

Mr. BURTON. Then this is how it works. For Miramar or any other facility similarly situated, if they see a problem and if one of the aircraft—conceivably if both of the aircraft did not have to be tied in on them for them to see the problem——

Mr. DRIVER. The Cessna was.

Mr. BURTON. But it didn't have to be because PSA was seen and they were not tied in. Conceivably, they could see a problem when neither plane was on their frequency. Is that right?

Mr. DRIVER. Let me give you a scenario.

Mr. BURTON. I understand the scenario. My question is this. Conceivably, Miramar could see a potential problem even though neither plane was on their frequency; is that right?

Mr. DRIVER. Yes; they could see it on the scope.

Mr. BURTON. The only way they could deal with that is to go from Miramar to the tower to the planes; is that right?

Mr. DRIVER. That is true if the aircraft involved were not on the frequency over which Miramar is transmitting. In this case that was true. The PSA was on the tower frequency.

Mr. BURTON. Why is it not possible for them to make direct emergency calls to PSA? I know what the procedure is, but I wonder why there is not some kind of emergency frequency for these situations.

Mr. DRIVER. We are not talking about frequencies.

Mr. BURTON. It may be a scientific impossibility?

Mr. DRIVER. Each radio has to be tuned to one frequency at a time. At this time we are not sure which frequency PSA was tuned into except that we know they were tuned into the tower.

Mr. BURTON. If a radio is tuned into that, it is impossible for someone else to cut in?

Mr. DRIVER. That is correct. It is just like the radio in your car. You listen to one station at a time.

Mr. HIGHTOWER. Mr. Chairman, may I interpose and say that the tower had the same information that Miramar had. It had the same scope; isn't that right?

Mr. BURTON. But one plane was on one frequency and one was on the other.

Mr. HIGHTOWER. But didn't the tower have the same ability to see the potential collision that Miramar did?

Mr. DRIVER. They might have had the opportunity to see the aircraft visually. I am not sure about the juxtaposition of the aircraft.

Mr. HIGHTOWER. Doesn't the tower have a radarscope?

Mr. DRIVER. We don't know yet.

Mr. BURTON. In other words, PSA was coming under visual——

Mr. DRIVER. He had been under instrument-flight rules but not necessarily instrument-flight conditions and was translating from IFR flight rules into a visual flight approach.

Mr. BURTON. So we do not know if the tower warned PSA, and we do not know if Miramar contacted the tower; is that right?

Mr. DRIVER. At this point we do not know, sir. Lindbergh is a VFR tower and the traffic is controlled out of Miramar. We have that information.

Mr. BURTON. What does that mean?

Mr. DRIVER. We do not know exactly what type of electronic equipment was in that tower since it was a VFR tower. We don't know what type of scopes or whatever. The VFR tower can range from a building on top of a pole where one guy is watching, like in a very small field, to a very sophisticated-type tower.

Mr. BURTON. Do we know how soon the Miramar warned the Cessna before the collision?

Mr. DRIVER. Timewise, we do not know. But we do know it was shortly after the conflict alert was superimposed on the scope when both of them started blinking.

Mr. BURTON. Thank you.

We will now take your summary of your testimony on the other issue.

Do any members have further questions on the information on the accident yesterday?

Mr. HIGHTOWER. Mr. Chairman, you say that these can only be tuned into one at a time. Yet, I do not understand the fact that Miramar controlled one aspect and the tower controlled another. Both had information that needed to go to the pilot at the same time and yet they were not coming in on the same radio frequency. Is that standard?

Mr. DRIVER. Yes, sir. Aircraft normally carry more than one radio.

Mr. HIGHTOWER. I can understand that. But you can broadcast on the same frequency from more than one point. It looks like if the pilot needs to receive information both from the tower and Miramar, that both ought to be broadcasting to that plane on the same frequency. But you say it is not true; is that right?

Mr. DRIVER. Under some circumstances it is possible to do that, but normally the tower frequencies are discrete frequencies operated by the towers only. There are separate frequencies for each tower so there is no interference.

Mr. HIGHTOWER. Then is it necessary for the pilot to switch back and forth if necessary that he have information from both places? What is the purpose of having Miramar and the tower if one provides one source of information and another provides another source and

you have to choose between which one you want but yet they don't give you the same type of information?

Mr. DRIVER. First of all, the utilization of one channel would put so much traffic on that one channel that it would be unusable.

In addition, Miramar is an approach control facility and it controls aircraft in the area. Once they get into a position to land they are turned over to the designated or appropriate landing facility via the tower. That is what happened with PSA.

Mr. HIGHTOWER. Then after they are in that position the approach control switches off and the tower takes over; is that right?

Mr. DRIVER. Yes.

Mr. HIGHTOWER. We have a situation here where one plane is landing and another had aborted their landing and was climbing back up. Both of them are supposed to be under the control of the tower. Is that right?

Mr. DRIVER. The Cessna was still under the control of Miramar. The landing aircraft was under the direct control of the tower.

Mr. HIGHTOWER. It would seem to me that we would have a lot of potential for this sort of thing to happen. You would have a missed approach and Miramar continues the control and the tower, even though he would be right over the landing strip, would have no way of communicating.

Mr. BURTON. There is no radar at the tower.

Mr. HIGHTOWER. I understand, but where there is a missed approach and he is still under the control of the approach control, but yet he is within the visual jurisdiction of the tower, then the tower has no way of contacting him. I wonder about that.

Mr. DRIVER. You are quite correct. In this particular situation, almost at the same moment you have an aircraft that is transferring from a control frequency to a tower frequency, you have another aircraft that is going from the tower frequency to a control frequency.

Evidently, this was happening quite close to each other. This is normal for the way traffic is controlled at an airport. Aircraft landing are controlled by the tower. The aircraft that are coming to approach the field or departing from the field are transferred over to the control of the air traffic controller for that area. That is what happened in this particular case.

As I indicated before, there is much more information that we need to gather. We have only preliminary information. When we get the tapes, particularly the tower tapes, we will know more about what happened.

Mr. HIGHTOWER. I understand, but I am talking about generally. I am talking about Dulles Airport, or National Airport, or whatever.

If you have one area where they are both landing and under the approach control and yet you have two people controlling what is happening in one spot and they are not telling each other, then what about that?

Mr. BURTON. If the gentleman will yield, to make it even worse, Miramar is the control facility for four airports within an 8-mile region.

Mr. DRIVER. It has been a long time since I have been out there, but I think there are four airports there, yes.

Mr. BURTON. Congressman Van Deerlin has told us that.

Mr. HIGHTOWER. We could have a situation at, let's say, National Airport with someone coming in at one end of the runway under the approach control and someone aborting a landing or a takeoff at the other end of the same runway under a different jurisdiction and nobody telling the other what is happening. Isn't that correct? Is this possible?

Mr. DRIVER. It is not that close. Under actual instrument conditions they would both be under the air traffic controller. This was a VFR condition.

Mr. HIGHTOWER. The VFR conditions happen pretty often, don't they?

Mr. DRIVER. That is true.

Mr. BURTON. Especially in our State.

Mr. HIGHTOWER. You mean in sunny California?

Mr. BURTON. Right.

Mr. HIGHTOWER. I think you have answered my question. I just do not like the answer. [Laughter.]

Mr. DRIVER. We don't like the conditions either.

Mr. BURTON. I have one more question before I yield to Mr. English. Who runs Miramar? Is it the FAA or the Navy?

Mr. DRIVER. The control is run by the FAA. The field is under the jurisdiction of the Navy, I think.

Mr. BURTON. Do FAA personnel and not Navy personnel man the radarscope?

Mr. DRIVER. Yes.

Mr. BURTON. Mr. English?

Mr. ENGLISH. Thank you, Mr. Chairman.

As I understand it, we have the Cessna which is practicing an instrument landing. They aborted the landing and the takeoff.

However, the conditions were such that an instrument landing was not necessary. It was simply practice. Is that correct?

Mr. DRIVER. It was strictly practice. It is normally done when someone is trying to get an instrument ticket. It is a simulated instrument approach. In many cases the pilot is the student who is under the hood and can see nothing. The missed approach is normally done so you do not execute a full landing and tie up the field because it takes time to land and taxi and take off again.

Mr. ENGLISH. I recognize that, but the point I am getting at is this. Is that the reason that the Cessna was under the control of Miramar rather than being under the control of the tower? Normally, coming in for a landing at the point where that individual was making a landing, would he not normally be under the control of the tower rather than under the control of Miramar?

Mr. DRIVER. You are correct. He was under the control of the tower, but as indicated, he had just switched back.

Mr. ENGLISH. We had a case where both pilots were switching their radios at approximately the same time.

Mr. DRIVER. I don't know the time span between the two, but they were switching.

Mr. ENGLISH. So, would it not also be true about this? It seems strange. You had one plane coming in from one direction and another

plane coming in from another direction insofar as the landing was concerned. One was going down and the other upwind; is that correct?

Mr. DRIVER. Yes, two separate runways. One aircraft never intended to land which was the Cessna.

Mr. ENGLISH. Yes, but I am talking about normal conditions. If the Cessna had not been practicing, they would have both been landing from approximately the same direction; isn't that correct?

Mr. DRIVER. That is correct.

Mr. ENGLISH. Rather than having the conflict where they were both approaching each other; isn't that right?

Mr. DRIVER. That is correct.

Mr. ENGLISH. So, under normal conditions, if the Cessna had not been practicing landings and takeoffs and instrument approaches, then you would not have had this set of conditions arise. Is that correct?

Mr. DRIVER. That is quite correct. The Cessna would not have been anywhere near that position at that time under controlled conditions.

Mr. ENGLISH. So you have an unusual situation created there.

The second unusual condition is one in which you had both pilots switching radio frequencies at approximately the same time, one going back under the control of Miramar and the second going under the control of the tower at San Diego. So, they both were changing channels at approximately the same time; is that right?

Mr. DRIVER. The timing was unusual. It is not unusual for them to switch channels.

Mr. ENGLISH. Yes, but the timing is the second part of the unusual aspect.

So, in effect you had a hole in that particular section, that is, from the standpoint of an unusual nature of the practice landings and takeoffs of the Cessna and the unusual nature of the fact that you had a situation in which the two pilots were changing radio frequencies at approximately the same time. Is that correct?

Mr. DRIVER. That is correct.

Mr. ENGLISH. So you had two unusual situations developing here which, in effect, produced the criteria necessary for the accident; isn't that right?

Mr. DRIVER. Based on the information we have now, yes.

Mr. ENGLISH. I see.

Would it have been possible to have, through simulators, produced the possibility of such a conflict arising—such an unusual set of circumstances arising?

Mr. DRIVER. Through simulation?

Mr. ENGLISH. Yes.

Mr. DRIVER. You could produce that situation anywhere, at anytime, any place through simulation?

Mr. ENGLISH. But would it not also be correct that that would be a situation which would not be too likely to have been forecast? If a person were sitting down there and drawing up the traffic at the airport and what they would consider to be a good traffic flow in and out of that airport with the conditions that you have that are peculiar to that particular airport, would it not be somewhat unusual for someone to predict that those types of difficulties are likely to arise? I am talking about a simulator versus manmade.

Mr. DRIVER. I do not think it would be too difficult to predict that such a conflict of airspace could occur. In fact——

Mr. ENGLISH. How often would you have this type of situation develop?

Mr. DRIVER. In a busy airport, very many times you have these airplanes close together.

Mr. ENGLISH. That close together?

Mr. DRIVER. Not that close together because they hit.

Mr. ENGLISH. It is not unusual to have one aircraft flying downwind and another aircraft coming in upwind with the two individuals in that particular space both switching radio frequencies?

Mr. DRIVER. That is unusual.

Mr. ENGLISH. That is what I thought. It seems to me the chances of that happening are pretty slim. I would think that an individual who is sitting there trying to plot out what the traffic flow is at that airport and planning out flight paths and projecting the safest possible route to bring that traffic in there would not be too likely to project that that could be a problem at some point.

Mr. DRIVER. That is true except for one thing. In this particular case the conflict alert went off advising the controller.

Mr. ENGLISH. It is obvious that the conflict alert did not work.

Mr. DRIVER. It works.

Mr. ENGLISH. It did not work as a safety factor and prevent the crash.

Mr. DRIVER. It worked inasmuch as it advised the cognizant people that there could be an imminent crash.

Mr. BURTON. You mean to say a cognizant person—one plane?

Mr. DRIVER. No, sir. It advised the controller who took steps to try to, we think, notify the two aircraft that something was wrong.

Mr. ENGLISH. Something was short-circuited someplace. I don't think they deliberately ran together.

Mr. DRIVER. I think the missing link could have been that even though advised—and let's assume they had both been advised that there was another aircraft in the area—still the human element of see-and-be-seen remains. Even though I may know that you are to my right and to the rear about 1,400 feet, if I can't see you there, I don't know what evasive action to take. That is me speaking personally.

Mr. ENGLISH. Are you saying, then, that the two pilots could not see each other?

Mr. DRIVER. I said that is possible.

Mr. ENGLISH. You would not state that if the two pilots could see each other, they would deliberately run into each other.

Mr. DRIVER. I'll buy that.

Mr. ENGLISH. I thought that was a pretty safe assumption.

So, it is obviously a matter of a short circuit at some point, whether it is the position of the aircraft or the descent and the takeoff level at which both pilots were blind—I think you would almost have to have both of them blind and unless one of them is taking evasive action of some type.

Mr. DRIVER. Yes, that is what we are going to find out.

Mr. ENGLISH. Is it not also true that the San Diego Airport is considered one of the most dangerous airports in the Nation?

Mr. DRIVER. I do not know that.

Mr. ENGLISH. I thought the San Diego Airport had a highly unusual approach pattern. This was mainly because of noise levels and the distribution of residents in that area. There is a particularly deep descent required to that airport.

Mr. DRIVER. In response to your first statement, I know of no tabulation which depicts the relative danger of airports in the United States. I have heard comments that San Diego is an undesirable airport to go into because of the geographic characteristics.

Mr. ENGLISH. That is what I am talking about.

Mr. DRIVER. I have hauled cargo into there several times. I didn't particularly like the descent pattern.

Mr. ENGLISH. That is what I am talking about. It has an unusual approach because of the geographic nature and due to the fact of the distribution of the residents.

Mr. HIGHTOWER. If the gentleman will yield, according to the press reports it is the first fatal accident in 50 years.

Mr. ENGLISH. I am not referring to the press reports. What I am referring to is some hearings we had previously which did chart out and specify the airports of the Nation that had the potential for an accident to happen. This is considered one of the most dangerous. There were numerous others due to the traffic flow and the landings required, and the numerous environmental requirements that have changed the descent patterns that you would normally have at an airport. As a result of all this, I believe there was information that was compiled that did point out the major airports around the Nation that were considered the most dangerous. I think San Diego was one of those that topped that group.

Mr. DRIVER. I must admit that I am not privy to that.

Mr. ENGLISH. But you are aware that this has an unusual approach pattern.

Mr. DRIVER. Yes.

Mr. ENGLISH. In your opinion, if the PSA plane had been equipped with the collision avoidance system, would that have prevented this accident?

Mr. DRIVER. I do not know enough about the particulars to properly respond. I guess it would depend upon the type of collision avoidance system that was aboard.

In this particular case, it might have been such a sophisticated piece of equipment that you would have to take over the controls and move the aircraft, particularly if the pilot could not see which way to go. That is just pure conjecture on my part.

Mr. ENGLISH. You stated that we have a somewhat unusual situation. We have a highly unusual situation inasmuch as the circumstances that occurred; namely, one airplane landing downwind and another one that is taking off. One is going up in the opposite direction and they are heading toward each other. At approximately the same time both pilots are switching radio frequencies. This is an unusual set of circumstances and highly difficult to predict.

Now, you have stated that simulators could have forecast this type of a situation and could develop one to be aware of; is that correct?

Mr. DRIVER. I do not think that someone could predict—I don't think I said that simulators could predict, but they can depict situations.

Mr. ENGLISH. Yes. But as I stated earlier, the FAA, for nearly 10 years now, has had the authority—or I should say in all fairness for 7 years now—for simulation. Congress voted the money. This is to train the air traffic controllers. One of those simulators which the FAA was looking very hard at, and one which some people say they actually contracted for, and one which was actually built were all considered. Simulators are now being used in Canada. In fact, they helped plan the new airport up in the Ontario-Montreal area. They worked out the air traffic patterns up there through that simulator.

Is it not true that if we had had such a simulator in place and if the FAA and the air traffic controllers and those who are in charge of the airport had used such a simulator or had been able to use such a simulator, that they possibly could have avoided this type of a situation by predicting or depicting, if you like, that this is a danger point and one to be aware of?

Mr. BURTON. For the record, none of our questions involves the responsibility of NTSB, of course. You are there to find the probable cause of accidents. Questions are asked of you on the basis of your experience. They are not asked of you in the same way that they will be asked of Mr. Bond of the FAA who does have that responsibility.

Mr. ENGLISH. Mr. Chairman, I am simply asking the opinion of the witness.

Mr. BURTON. I understand that. You know that. I wanted the record to indicate that for those in the audience who might not understand that. I am in agreement with you. I didn't want people to get the idea that the foulups come under the jurisdiction of NTSB.

Mr. DRIVER. Mr. Chairman and Mr. English, if there is hesitancy on my part to respond, I want to make sure that I respond on the basis of the facts. The information that we have so far is rather sketchy. I did not want to mislead the committee by any means.

There are two types of simulators. I hope we are not getting them mixed up. One simulator which would simulate like flying an aircraft or actually controlling the aircraft is the first one.

There is another simulator which can depict certain conditions and practice. Are you talking about the latter?

Mr. ENGLISH. That is correct.

Mr. DRIVER. Let me ask Mr. Clarke to respond to that. I have seen the equipment in operation, but I am not thoroughly familiar with the way it operates.

Mr. Clarke?

Mr. CLARKE. I was going to say that the FAA does have a very elaborate facility in Atlantic City where they do have equipment of the type I believe you are referring to. They do some simulations of that type. I am not sure how extensive these simulations are and whether it would take care of the point you are making.

Mr. ENGLISH. We will clarify that with Mr. Bond, but I don't believe they have that kind of capability.

The reason I am making this point is that it is my understanding that when the Canadians built that new airport in Montreal and Ontario, that they went through manually the normal procedure that you would go through in laying out a traffic pattern.

Once they placed that traffic pattern on a simulator, however, they found that they had what I would describe as holes, difficulties and possibilities of difficulties.

Through that procedure they were able to redesign the traffic flow around their airport so as to eliminate that type of situation.

At last they were able to point out to the controllers who were handling that traffic about the types of situations to be aware of.

It seems to me this would be one possibility. This is one area in which possibly we could have avoided this situation yesterday.

That is the type of thing I am getting at.

Mr. CLARKE. Probably, then, to the extent of the question that you have, it would probably be best to direct it to Mr. Bond when he is here Thursday.

Mr. ENGLISH. Mr. Bond is probably going to be slightly prejudiced because we have been going over this for about 3 or 4 years and they have not gotten the point. I can assure you we will go dancing it another time around.

But I wanted to get your opinion. I am not asking you necessarily for the facts. But, I am asking you for the points of criteria that we are talking about; namely, the two aircraft coming together under these circumstances with one practicing insofar as an instrument landing is concerned, while the other one is coming in under visual conditions. It seems to me that it is highly unusual that you would have that type of situation develop, particularly when the two are coming in and meeting each other.

The second, of course, is the situation where both pilots are switching back and forth between Miramar and the tower.

Mr. DRIVER. Mr. English, may I voice another opinion?

Mr. ENGLISH. Hindsight is great, and I am not asking you to say, "That's what they should have done."

I am asking whether it would have been possible under those conditions to have done that. Could we possibly have avoided the accident?

Mr. DRIVER. We think that many things could have prevented that accident, like better training and the use of simulators, as you indicate. Perhaps even if a BCAS system had been in place we might have. We cannot say for sure for now because we do not have the data.

We are not only interested in hindsight as evidenced by the hearing we held in New York 3 weeks ago wherein we investigated a near collision that happened to be on the ground. It was not an accident. The NTSB is concerned over the circumstances that can cause the intrusion of one aircraft into another aircraft space whether it be on the ground or in the air. We are not waiting until accidents occur before we take some type of action. This was demonstrated in the hearing we had in New York. It affected a takeoff aircraft and a landing aircraft. One was a small aircraft, and one was a larger aircraft.

Mr. BURTON. Is it safe to say the answer is that because of this accident we learned situations can happen and we can try to correct them; but that if FAA had a good simulation policy and something like this came up on the simulator—as bizarre as it may seem—that it would be something they could have had a program for; is that right?

Mr. DRIVER. I think that is a valid assumption, yes.

Mr. BURTON. If it is all right with you the pleasure of the Chair would be that, having had your statement in advance, I wonder if we could get to a few questions?

Mr. Driver. With the Chair's permission, if you notice we gave no information on collision avoidance systems in our prepared statement. In view of what happened yesterday, and in view of the discussion this morning, I would like to address that matter. I would like to state that we did not include that in our original statement because we, the Board, did not view the collision avoidance problem as being associated with type certification. Therefore, in the interest of giving more weight to the other problems, we left that out.

But I would like to give you some information at the present time. I would like to discuss the collision avoidance systems, Mr. Chairman.

The Safety Board has made several past recommendations to the FAA regarding the development of an effective collision avoidance system. We have purposely avoided a particular concept such as beacon collision avoidance system or BCAS or the ground-based discrete address beacon systems concept.

Rather, in accordance with the mandate from Congress, we wish to encourage the expeditious development and implementation of the most effective and economically feasible system so we have not said airborne or ground-based. We say get a system that works.

Incidentally, I have a computer run of the recommendations that we have made in this regard to FAA. With your approval, we would have that inserted into the record.

Mr. Burton. Without objection, it will be made a part of the record.

[The material follows:]

ITEM 1

ACCESSION NUMBER : 646
GENERAL FILE CODE : 186
SPECIFIC FILE CODE : 186
FILE TYPE : RECOMMENDATION
LOG NO : 470
RECOMMENDATION NO : A-73-46
ISSUE DATE : 730709
MODE : AVIATION
RECOMMENDATION SUBJECT : REVIEW THE ARTS III PROGRAM FOR THE POSSIBLE DEVELOPMENT OF PROCEDURES TO AID FLIGHTCREWS WHEN MARKED DEVIATIONS IN ALTITUDE ARENOTICED BY AN AIR TRAFFIC CONTROLLER.
ACTION AGY/ORGANIZ : FAA
ACTION AGY RESP DUE : 731009
ACTION AGY ACTUAL RESP : 730816
NATURE OF AGY/ORG RESPONSE : 8/16/73 LETTER FROM THE FAA TO SAY THAT PRELIMINARY INVESTIGATION INDICATES ADDITIONAL HARDWARE AND MAJOR SOFTWARE MODIFICATIONS WOULDBE NECESSARY TO IMPLEMENT THE RECOMMENDATION. SOME PROBLEMS OF COMPATIBILITY WITH THE OPERATIONAL PROGRAM ARE APPARENT IN SUCH AREAS AS MULTIPLE APPROACH/DEPARTURE PATHS, TERRAIN AND OBSTRUCTIONS, ETC.; HOWEVER, THEY INTEND TO EXERT EVERY EFFORT TOWARD RESOLUTION OF THESE PROBLEMS. UNTIL FAA ARE MORE KNOWLEDGEABLE IN THESE AREAS, THEY ARE UNABLE TO PREDICT A DEGREE OFSUCCESS. HOWEVER, THEY WILL KEEP THE BOARD ADVISED. IN CONSONANCE WITH FAA'S STATED INTENT TO MONITOR TECHNOLOGICAL DEVELOPMENTS REGARDING GROUND PROXIMITY WARNING INDICATORS AND TO ELICIT COMMENTSFROM OPERATORS, MANUFACTURERS, AND OTHER INTERESTED PERSONS, AN ADVANCED NOTICE OF PROPOSED RULEMAKING WAS ISSUED APRIL 18, 1973. THE RESPONSE TO THIS NOTICE WILL BE CONSIDERED IN ANY RULEMAKING IN THIS AREA.RESPONSE DATED 5/31/77 FAA REPORTS THAT A MINIMUM SAFE ALTITUDE WARNING SYSTEM (MSAW) HAS BEEN DEVELOPED AS AN INTEGRAL FUNCTION OF THE ARTS III COMPUTER PROGRAM. ADVISORYCIRCULAR AC 90-72, FAA NEWS RELEASE "FACT SHEET-MSAW", ANDPARAGRAPH 33, "SAFETY ADVISORY" RELATED TO PRESCRIBEDCONTROL PROCEDURES FROM THE AIR TRAFFIC CONTROL HANDBOOK7110.65 ALL EXPLAIN THE FUNCTION OF MSAW. BY JUNE 1977,SIXTY-THREE ARTS III TERMINAL FACILITIES WILL BE MSAW EQUIPPED. THE PROCEDURES DEVELOPED WILL MINIMIZE INADVERTENTDESCENT INTO THE GROUND.
STATUS OF REC(NTSB) : CLOSED - ACCEPTABLE ACTION
RECOM ABSTRACT : AN EASTERN AIR LINES LOCKHEED L-1011 CRASHED AT 2342 EASTERN STANDARD TIME, DECEMBER 29, 1972, 18.7 MILES WEST-NORTHWEST OF MIAMI INTERNATIONAL AIRPORT, MIAMI, FLORIDA. THE AIRCRAFT WAS DESTROYED. OF THE 163 PASSENGERS AND 13 CREWMEMBERS ABOARD, 94 PASSENGERS AND 5 CREWMEMBERS RECEIVED FATAL INJURIES. TWO SURVIVORS DIED LATER AS A RESULT OF THEIR INJURIES. FOLLOWING A MISSED APPROACH BECAUSE OF A SUSPECTED NOSE GEAR MALFUNCTION, THE AIRCRAFT CLIMBED TO 2,000 FEET MEAN SEA LEVEL AND PROCEEDED ON A WESTERLY HEADING. THE THREE FLIGHT CREWMEMBERS AND A JUMPSEAT OCCUPANT BECAMEENGROSSED IN THE MALFUNCTION. THE NATIONAL TRANSPORTATION SAFETY BOARD DETERMINES THAT THE PROBABLE CAUSE OF THIS ACCIDENT WAS THE FAILURE OF THE FLIGHTCREW TO MONITOR THE FLIGHT INSTRUMENTS DURING THE FINAL 4 MINUTES OF FLIGHT, AND TO DETECT AN UNEXPECTED DESCENT SOON ENOUGH TO PREVENT IMPACT WITH THE GROUND. PREOCCUPATION WITH A MALFUNCTION OF THE NOSE LANDING GEAR POSITION INDICATING SYSTEM DISTRACTED THE CREW'S ATTENTION FROM THE INSTRUMENTS AND ALLOWED THEDESCENT TO GO UNNOTICED.
KEYWORDS : TA COLLISION TERRAIN ; PO APPROACH ; TO AIR CARRIER DOMESTIC ; LL FATAL ; TV FIXED WING ; DE HEAVY ; DE MULTI-ENGINE ; ALTITUDE ALERT ; REVIEW PROGRAM ; DEVELOP PROCEDURES ; WARN DEVICE ; RADAR ARTS ;; AIR TRAFFIC CONTROL

ITEM 2

ACCESSION NUMBER : 792
GENERAL FILE CODE : 216
SPECIFIC FILE CODE : 216
FILE TYPE : RECOMMENDATION
LOG NO : 402
RECOMMENDATION NO : A-72-157
ISSUE DATE : 720921
MODE : AVIATION
RECOMMENDATION SUBJECT : DEVELOP A TOTAL MIDAIR COLLISION PREVENTION SYSTEM APPROACH TO INCLUDE TRAINING, EDUCATION, PROCEDURES, ATC EQUIPMENT AND PRACTICES, AND THE DEVELOPMENT OF COLLISION AVOIDANCE SYSTEMS AND PROXIMITY WARNING INSTRUMENTS THAT ARE COST FEASIBLE TO THE GENERAL AVIATION COMMUNITY.
ACTION AGY/ORGANIZ : FAA
ACTION AGY RESP DUE : 721221
ACTION AGY ACTUAL RESP : 721002
NATURE OF AGY/ORG RESPONSE : SYSTEM APPROACH BEING FOLLOWED. CAS AND PWI UNDER DEVELOPMENT.
STATUS OF REC(NTSB) : CLOSED - ACCEPTABLE ACTION
RECOM ABSTRACT : A SPECIAL ACCIDENT PREVENTION STUDY WHICH ANALYZES THE COMMONALITY OF MIDAIR COLLISIONS OF AIRCRAFT AND WHICH UPDATES THE 1968 NATIONALTRANSPORTATION SAFETY BOARD MIDAIR COLLISION STUDY, INCLUDING A REVIEW OF THE 1969 AND 1970 MIDAIR COLLISION REPORTS.
KEYWORDS : TA COLLISION WITH AIRCRAFT AIRBORNE ; WARNING SYSTEMS ; WARNDEVICE ; COCKPIT PROCEDURES ; FLIGHT RULES ; COCKPIT CREW ;PERFORMANCE ; TRAINING ; DEVELOP PROCEDURES ; PROGRAM STANDARDS ; SEPARATION ;; VEHICLE OPERATION; AIR TRAFFIC CONTROL; CREW MEMBERS

ITEM 3

ACCESSION NUMBER : 1098
GENERAL FILE CODE : 300
SPECIFIC FILE CODE : 300
FILE TYPE : RECOMMENDATION
LOG NO : 220
RECOMMENDATION NO : A-71-7
ISSUE DATE : 710222
MODE : AVIATION
RECOMMENDATION SUBJECT : ENCOURAGE THE EXPEDITIOUS DEVELOPMENT OF A COLLISION AVOIDANCE SYSTEM FOR INSTALLATION IN AIR CARRIER AIRCRAFT AND LARGER GENERAL AVIATION AIRCRAFT.
ACTION AGY/ORGANIZ : FAA
ACTION AGY RESP DUE : 710522
ACTION AGY ACTUAL RESP : 710325
NATURE OF AGY/ORG RESPONSE : UNDER DIRECTION OF THE AIR TRANSPORT ASSOCIATION (ATA), CAS SYSTEMS BEING DEVELOPED BY BENDIX, MCDONNELL DOUGLAS AND A TEAM OF SIERRA RESEARCH AND WILCOX ELECTRONICS. FAA INVOLVED IN A COOPERATIVE PROGRAM WITH ATA IN THE CONTINUING DEVELOPMENT OF A TIME/FREQUENCY VERSION CAS. COMPREHENSIVE FLIGHT TESTS WERE CONDUCTED INVOLVING THREE MANUFACTURERS' VERSIONS OF THE AIRBORNE PACKAGE. A JOINT NAVY/FAA PROGRAM UNDERWAY TO EVALUATE RCA'S SECANT PWI/CAS SYSTEM.
STATUS OF REC(NTSB) : CLOSED - ACCEPTABLE ACTION
RECOM ABSTRACT : THE NATIONAL TRANSPORTATION SAFETY BOARD, ON NOVEMBER 4, 1969, CONVENED A PUBLIC HEARING FOR THE PURPOSE OF INQUIRING INTO THE CAUSE AND PREVENTION OF MIDAIR COLLISIONS. THE BOARD, SITTING EN BANC, HEARD THE TESTIMONY OF 26 WITNESSES, INCLUDING REPRESENTATIVES OF THE UNITED STATES GOVERNMENT, THE AVIATION INDUSTRY, AND MEMBERS OF THE PUBLIC. ALSO RECEIVED INTO THE RECORD WERE WRITTEN STATEMENTS FROM 12 ORGANIZATIONS AND INDIVIDUALS.
KEYWORDS : TA COLLISION WITH AIRCRAFT AIRBORNE ; SEPARATION ; WARNING SYSTEMS ; DEVELOP PROGRAM ; EXPEDITE RESEARCH ;; AIR TRAFFIC CONTROL

ITEM 4

ACCESSION NUMBER : 1099
GENERAL FILE CODE : 300
SPECIFIC FILE CODE : 300
FILE TYPE : RECOMMENDATION
LOG NO : 220
RECOMMENDATION NO : A-71-8
ISSUE DATE : 710222
MODE : AVIATION
RECOMMENDATION SUBJECT : MAKE FUNDS AVAILABLE FOR THE GROUND EQUIPMENT WHICH MAY BE NECESSARY FOR SUPPORT OF CAS SYSTEMS.
ACTION AGY/ORGANIZ : FAA
ACTION AGY RESP DUE : 710522
ACTION AGY ACTUAL RESP : 710325
NATURE OF AGY/ORG RESPONSE : THE CURRENT FAA 10-YEAR PLAN INCLUDES FUNDING FOR A CAS GROUND STATION DEVELOPMENT, FABRICATION, AND TEST AND EVALUATION PROGRAM. SIMILARLY, THE PLAN PROVIDES FOR FUNDING PRODUCTION EQUIPMENT.
STATUS OF REC(NTSB) : CLOSED - ACCEPTABLE ACTION
RECOM ABSTRACT : THE NATIONAL TRANSPORTATION SAFETY BOARD, ON NOVEMBER 4, 1969, CONVENED A PUBLIC HEARING FOR THE PURPOSE OF INQUIRING INTO THE CAUSE AND PREVENTION OF MIDAIR COLLISIONS. THE BOARD, SITTING EN BANC, HEARD THE TESTIMONY OF 26 WITNESSES, INCLUDING REPRESENTATIVES OF THE UNITED STATES GOVERNMENT, THE AVIATION INDUSTRY, AND MEMBERS OF THE PUBLIC. ALSO RECEIVED INTO THE RECORD WERE WRITTEN STATEMENTS FROM 12 ORGANIZATIONS AND INDIVIDUALS.
KEYWORDS : TA COLLISION WITH AIRCRAFT AIRBORNE ; WARNING SYSTEMS ; EXPEDITE PROGRAMS ; SEPARATION ; WARN DEVICE ;; AIR TRAFFIC CONTROL

ITEM 5

ACCESSION NUMBER : 1263
GENERAL FILE CODE : 378
SPECIFIC FILE CODE : 378
FILE TYPE : RECOMMENDATION
LOG NO : 70-21
RECOMMENDATION NO : 70-8
ISSUE DATE : 690827
MODE : AVIATION
RECOMMENDATION SUBJECT : BOARD RECOMMENDED SEPARATION OF "KNOWN" AND "UNKNOWN" TRAFFIC OPERATIONS TO THE BROADEST EXTENT PRACTICABLE BE ACHIEVED, CONSIDERATION BE GIVEN TO THE DESIGNATION OF LARGER SEGMENTS OF THE NAVIGABLE AIRSPACE AS POSITIVE CONTROL AREAS TO INCLUDE TERMINAL AREAS. REGARDING MILWAUKEE TERMINAL, THE MIX OF KNOWN AND UNKNOWN TRAFFIC BE REDUCED BY RESTRUCTURING VICTOR AIRWAY 479. ALL USERS OF AIRSPACE MAKE EVERY EFFORT TO ACHIEVE THE MAXIMUM BENEFIT FROM VISUAL DETECTION PARTICULARLY IN TERMINAL AREAS WHERE THERE IS APT TO BE A MIXTURE OF LARGE HIG-SPEED AIRCRAFT AND SMALL RELATIVELY LOW-SPEED AIRCRAFT. WHEN TRAFFIC ADVISORIES ARE RECEIVED, BOTH PILOTS OF EACH AIR CARRIER AIRCRAFT COORDINATE THEIR EFFORTS TO ASSURE THAT THE DESIGNATED AREAS ARE THOROUGHLY SCANNED. AIR CARRIERS EMPHASIZE, BOTH DURING TRAINING AND OPERATIONS, THE ENTIRE SPECTRUM OF SITUATIONS IN WHICH THE USE OF AN AVOIDANCE VECTOR WOULD BE ADVISABLE. INSPECTION FORMS INCLUDE A WINDSHIELD CLEANING REQUIREMENT AT ALL MAINTENANCE STATIONS AS WELL AS A MANDATORY CLEANING AND SIGN-OFF OF ANY DIRTY WINDSHIELD COMPLAINT MADE BY A FLIGHT CREW. STUDIES BE CONDUCTED TOWARDS DEVELOPMENT OF IN-FLIGHT MEASURES TO CLEAN WINDSHIELDS BY DEFLECTING AIRFLOW, WINDOW WASHING OR USE OF CHEMICAL REPELLENTS. BOARD URGES EARLY DEVELOPMENT OF A LOW COST AIRBORNE COLLISION AVOIDANCE EQUIPMENT, FOR USE OF ALL TYPES OF AIRCRAFT, TO SUPPLEMENT THE SERVICE PROVIDED BY THE AIR TRAFFIC CONTROL SYSTEM.
ACTION AGY/ORGANIZ : FAA
ACTION AGY RESP DUE : 691127
ACTION AGY ACTUAL RESP : 690916

NATURE OF AGY/ORG RESPONSE : FAA DEVELOPING A PLAN UNDER WHICH ALL PILOT WOULD BE CONTROLLED WITHIN A PORTION OF THE AIRSPACE SURROUNDING SELECTED HIGH TRAFFIC DENSITY AIRPORTS. THE OBJECT IS TO ELIMINATE THE "UNKNOWNS" (THE UNCONTROLLED TRAFFIC) FROM THE AIRSPACE WHEN CONGESTION IS REACHING A CRITICAL LEVEL. IT IS ANTICIPATED THAT A NOTICE OF PROPOSED RULE MAKING WILL BE ISSUED FOR PUBLIC COMMENT IN THE NEAR FUTURE. A FEASABILITY STUDY IS BEING UNDERTAKEN TO DETERMINE THE VALIDITY TORELOCATE THE V479. NOTICE 8430.49, REVIEW OF COCKPIT CHECK PROCEDURES REQUIRES PILOTS AND OPERATIONS INSPECTORS TO ASCERTAIN THAT COCKPIT PROCEDURES WERE USED TO MINIMIZE ATTENTION INSIDE THE COCKPIT. ISSUE OF NOTICE OF PROPOSED RULE MAKING, NPRM 69-14, PROPOSES RULES THAT WILL ALLOW FOR INCREASED AIRCRAFT SIMULATOR USAGE VICE ACTUAL AIRCRAFT TIME. THIS PROVIDES FOR FURTHER REDUCTIONOF THE MIDAIR COLLISION POTENTIAL. AIR CARRIER EN ROUTE INSPECTION REPORT, FORM 8430.5 IS BEING REVISED TO ADD A SPECIFIC INSPECTION ITEM COVERING CREW COCKPIT VIGILANCE. INFORMATION ON MIDAIR COLLISIONS IS AVAILABLE TO ALL PILOTS IN ADVISORY CIRCULAR 90-37, FLIGHT OPERATIONS NEAR AIRPORTS AND THE AIRMAN'S INFORMATION MANUAL, PART 1, PAGES 1-43, NEAR MIDAIR COLLISION REPORTING PROCEDURES. AIR CARRIERS OPERATIONS INSPECTOR'S HANDBOOK BEING REVISED TO INCLUDE A CONTINUING EDUCATIONAL PROGRAM TO MAKE PILOTS AWARE OF WHERE MOST MIDAIR COLLISIONS OCCUR AND OF THE AVAILABLE AVOIDANCE TECHNIQUES. USE OF RADAR VECTORS WILL BE SUGGESTED WHEN WARRANTED. A MAINTENANCEBULLETIN TO RE-EMPHASIZE THE IMPORTANCE OF WINDSHIELD CLEANING WILL BE ISSUED.
STATUS OF REC(NTSB) : CLOSED - ACCEPTABLE ACTION
RECOM ABSTRACT : AT 0948 C.D.T., ON AUGUST 4, 1968, NORTH CENTRAL AIRLINES FLIGHT 261A CONVAIR 580, N4634S, AND A HOME AIRMOTIVE, INC., CESSNA 150, N8742S, COLLIDED APPROXIMATELY 11.5 MILES SOUTHWEST OF GENERAL MITCHELL AIRPORT, MILWAUKEE, WISCONSIN, AT AN ALTITUDE OF 2,700 FEETALL MAJOR COMPONENTS OF THE CESSNA FELL TO THE GROUND, WITH THE EXCEPTION OF THE CABIN SECTION WITH ITS THREE OCCUPANTS AND THE ATTACHED LANDING GEAR, WHICH WERE EMBEDDED IN THE CONVAIR'S FORWARD BAGGAGE COMPARTMENT. DAMAGE SUSTAINED BY THE CONVAIR WAS EXTENSIVE, BUT CONTROLLED FLIGHT WAS MAINTAINED BY THE CAPTAIN AND A SUCCESSFULLANDING WAS ACCOMPLISHED AT GENERAL MITCHELL FIELD AT 0954.
KEYWORDS : TA COLLISION WITH AIRCRAFT ; PO EN ROUTE ; TO AIR CARRIER DOMESTIC ; TO LEASED ; LL FATAL ; TV FIXED WING ; DE LIGHT ; DE HEAVY ; DE SINGLE-ENGINE ; DE MULTI-ENGINE ; TCA ; SEPARATION ; WARNING SYSTEMS ; WINDOW ; FLIGHT RULES ; CONTROLLED ;; AIR TRAFFIC CONTROL; STRUCTURES

ITEM 6

ACCESSION NUMBER : 1275
GENERAL FILE CODE : 384
SPECIFIC FILE CODE : 384
FILE TYPE : RECOMMENDATION
LOG NO : 70-4
RECOMMENDATION NO : 70-2
ISSUE DATE : 690723
MODE : AVIATION
RECOMMENDATION SUBJECT : THE BOARD RECOMMENDED THAT THE FAA: 1. UNDERTAKE AN EDUCATIONAL PROGRAM TO MAKE BOTH PILOTS AND CONTROLLERS MORE AWARE OF THE MIDAIRCOLLISION PROBLEM, AND TO MAKE PILOTS AWARE THAT MOST COLLISIONS OCCUR AT OR NEAR AIRPORTS IN CLEAR WEATHER AND IN DAYLIGHT HOURS. 2. ESTABLISH A CONTINUING PROGRAM TO ASSURE INDOCTRINATION AND CONTINUING AWARENESS ON THE PART OF ALL PILOTS TO THE MIDAIR COLLISION POTENTIAL AND AVOIDANCE TECHNIQUES (I.E. "SEE AND BE SEEN"CONCEPT, DESCENT, TURN, AND CLIMB MANEUVERING TECHNIQUES, ETC.) 3. EXAMINE MORE STRINGENTLY

ALL PILOT APPLICANTS FOR THEIR EXTERNAL COCKPIT VIGILANCE, WITH PARTICULAR ATTENTION TO PILOTS WHO ARE TESTED FOR FLIGHT INSTRUCTOR RATINGS. 4. PROVIDE SPECIAL WARNING ANDGUIDANCE TO-PILOTS WHO ARE REQUIRED BY THE NATURE OF THEIR OPERATIONS TO FLY IN PAIRS. 5. INFORM ALL CERTIFICATED FLIGHT INSTRUCTORS OF THE HIGH STATISTICAL SIGNIFICANCE OF THEIR INVOLVEMENT IN MIDAIR COLLISIONS. 6. ENCOURAGE ALL INSTRUCTOR PILOTSTO NOTIFY THE CONTROL TOWER OPERATOR, AT AIRPORTS WHERE A TOWER IS MANNED, REGARDING FIRST SOLO FLIGHTS, AND REQUIRE THE TOWER OPERATOR TO ADVISE OTHER TRAFFIC IN THE PATTERN ABOUT SUCH FLIGHTS. 7. CONDUCT DETAILED TRAFFIC FLOW STUDIES FOR ALL HIGH-VOLUME GENERALAVIATION CONTROLLED AIRPORTS WITH A VIEW TO IMPROVING THE VFR TRAFFIC FLOW TECHNIQUES OF THE ATC PERSONNEL. 8. DESIGNATE CLIMB ANDDESCENT CORRIDORS FOR HIGHPERFORMANCE AIRCRAFT AT HIGH-DENSITY AIRPORTS. 9. IRRESPECTIVE OF THE PROVISIONS CONTAINED IN PART 91 OF THE FEDERAL AVIATION REGULATIONS, ESTABLISH STANDARD ENTRY, DEPARTURE, AND GO AROUND PROCEDURES FOR EACH UNCONTROLLED AIRPORT. 10. IN COOPERATION WITH ESSA, DEVELOP AND PRODUCE VFR APPROACH AND DEPARTURE CHARTS FOR SELECTED AIRPORTS WITH A HIGH VOLUME OF TRAFFIC. 11. IN ADDITION TO THE REQUIREMENTS OF SECTION 91.89 OF PART 91 OF THE FEDERAL AVIATION REGULATIONS, DEVELOP A REQUIREMENT FOR THE INSTALLATION OF SURFACE PATTERN INDICATORS (FOR DAY AND NIGHT) AT SMALLER AIRPORTS WHICH WOULD DEFINE SPECIFIC PATTERNS, PARTICULARLY THE BASE LEG AND THE FINAL APPROACH. 12. REEVALUATE VISUAL CONSPICUITY STANDARDS FOR ALL CIVIL AIRCRAFT. CONSIDER THE ESTABLISHMENT OF REQUIREMENTS FOR THE INSTALLATION AND DAY AND NIGHTOPERATION OF HIGH-INTENSITY WHITE FLASHING LIGHTS ON ALL CIVIL AIRCRAFT. SUPPORT THE EXPEDITIOUS DEVELOPMENT OF LOW-COST COLLISION AVOIDANCE SYSTEMS FOR ALL CIVIL AIRCRAFT. 69 - THE BOARD RESPONDED NOTING WITH APPROVAL, THE MANY STEPS THE FAA HAD TAKEN IN THE PAST CONCERNING THIS PROBLEM AND THE NUMEROUS PROGRAMS PLANNED AND UNDER STUDY. HOWEVER, DESPITE THESE MANY EFFORTS, AND IN THE WAKE OF THE MIDAIR COLLISION THAT OCCURRED IN INDIANA ON SEPT. 9, 1969, THE BOARD FELT THAT ADDITIONAL EMPHASIS SHOULD BE GIVEN TO THIS PROBLEM BY ALL PARTIES CONCERNED WITH AVIATION SAFETY. TO THIS END, THE BOARD WAS CONVENING A PUBLIC HEARING BEGINNING NOV. 4, 1969. IT WAS INTENDED TO DEVELOP A MORE COMPREHENSIVE DEFINITION OF THE PROBLEM, TO REVIEW CURRENT EFFORTS AND TO IDENTIFY AREAS WHERE CURRENT ACTIONCAN BE EXPEDITED AND NEW ACTION INITIATED.

ACTION AGY/ORGANIZ : FAA

ACTION AGY RESP DUE : 691023

ACTION AGY ACTUAL RESP : 690801

NATURE OF AGY/ORG RESPONSE : 9/9/69 1. FAA CONCURS. TRAINING FILM BEING PREPARED FOR DISTRIBUTIONIN FALL. ALSO EFFORTS REPRESENTED IN ADVISORY CIRCULARS, TRAINING MANUALS, FLIGHT TEST GUIDES AND AIRMAN'S INFORMATION MANUAL. PLAN TO KEEP THESE UPDATED. 2. FAA AGREES. PLAN TO ISSUE A NEW ADVISORY CIRCULAR IN WHICH THEY WILL ACCENTUATE COLLISION AVOIDANCE TECHNIQUES. 3. FAA STATES THEIR FLIGHT TEST GUIDES ARE PRECAUTIONARYIN THIS RESPECT; OTHERS WILL BE REVISED. THEIR FLIGHT TRAINING AND FLIGHT INSTRUCTORS HANDBOOKS SPEAK TO THE SUBJECT. PLAN TO STRESS THIS FURTHER IN THE PROPOSED ADVISORY CIRCULAR. 4. HAZARD RECOGNIZED. PROPOSED ADVISORY CIRCULAR WILL SO WARN. 5. ALL TRAININGMATERIAL EMPHASIZES IMPORTANCE OF VIGILANCE AND COLLISION AVOIDANCE.PLAN TO EMPHASIZE THESE IN PROPOSED ADVISORY CIRCULAR. 6. AIRMAN'S INFORMATION MANUAL AND EXISTING ADVISORY CIRCULAR ENCOURAGES THIS. THIS WILL BE EMPHASIZED IN PROPOSED ADVISORY CIRCULAR. OPPOSE PROCEDURE TO NOTIFY ALL OTHER TRAFFIC UNTIL DETERMINED THAT ADDED RESPONSIBILITY AND WORKLOAD CAN BE ABSORBED BY CONTROLLER. EXTRA ASSISTANCE IS PROVIDED TO STUDENT BY CONTROLLER WHEN STUDENT SO INDICATES. 9/9/69 7. FAA AGREES STUDIES SHOULD BE CONDUCTED. ENVIRONMENT CONSTRAINTS AFFECT TRAFFIC FLOW. VFR ROUTES AND CHECK POINTS SHOULD BE CHARTERED. 8. FAA WORKING TOWARDS A BROADER CONCEPT. NPRM WILL BEISSUED AFTER FINAL DECISION IS MADE. WILL EXPLORE CORRIDOR CONCEPT AT LOWER ACTIVITY LOCATIONS. 9. UNDER CONSIDERATION. ADVISORY CIRCULAR ESTABLISHES GOOD PROCEDURES FOR

PILOTS TO EXCHANGE INFORMATION. (CONTAINED IN AIRMAN'S INFORMATION MANUAL) 10. INTEND TO EXPAND THE NUMBER OF SPECIAL MAPS IN THE AIRMAN'S INFORMATION MANUAL WHICH ARE PREPARED AT THE REQUEST OF REGIONAL OFFICES. THESE WILL ALSO BE SHOWN ON SECTIONAL AND LOCAL CHARTS. 11. FAA HAS ISSUEDAN ADVISORY CIRCULAR WHICH RECOMMENDS STANDARDS AND PRACTICES. INSTALLATION OF SURFACE PATTERN INDICATORS ENCOURAGED AT ALL AIRPORTS. R&D PROJECT INITIATED FOR AUTOMATIC OR SEMI-AUTOMATIC INDICATORS. 12. EXTERIOR PAINT PATTERNS ABANDONED AS NOT EFFECTIVE AGAINST ALL BACKGROUNDS AND VARIOUS SIGHTING CONDITIONS. A PROPOSED RULE MADE SEVERAL YEARS AGO WAS WITHDRAWN AS UNSUPPORTABLE. 13. CONSIDERATION GIVEN TO WHITE FLASHING LIGHTS. RESEARCH ACCELERATED FOR HUMAN FACTORS DATA TO SUPPLEMENT SUBJECTIVE JUDGEMENTS. COMPANIES WITH VESTED INTERESTS HAVE PETITIONED TO REQUIRE THIS BUT HAVE BEEN DENIED FOR LACK OF JUSTIFICATION. IF CURRENT RESEARCH JUSTIFIES, ACTION WILL BE TAKEN. 14. FAA ACTIVELY COOPERATING WITH AIR TRANSPORT ASSOCIATION PROGRAM. RESOURCES BEING ALLOCATED FOR TEST OF ALL NEW ITEMS OF HARDWARE WHICH SHOW PROMISE. TWO PILOT WARNING INDICATORS ARE BEING TESTED THIS MONTH. INFRA-RED SENSING OFSTROBE LIGHTS BEING INVESTIGATED. IN ADDITION TO RESEARCH AND DEVELOPMENT PERSONNEL, REPRESENTATIVES FROM FAA'S LEGAL, AIR TRAFFIC AND FLIGHT STANDARDS SERVICES ARE PREPARING TO COPE WITH ASSOCIATED PROBLEMS.

STATUS OF REC(NTSB) : CLOSED - RECONSIDERED

RECOM ABSTRACT : THANK YOU FOR YOUR RESPONSE OF SEPTEMBER 9, 1969, TO OUR RECOMMENDATIONS AIMED AT THE PREVENTION OF MIDAIR COLLISION ACCIDENTS DATED JULY 23, 1969. IN THE WAKE OF THE TRAGIC MIDAIR COLLISION ACCIDENT AT SHELBYVILLE, INDIANA, ON SEPTEMBER 9, OUR JOINT TREATMENT OF THE MIDAIR COLLISION PROBLEM CERTAINLY EVOLVES ASURGENT. OUR COMMON GOAL IS TO REDUCE THE EXPOSURE TO, AND THE NUMBEROF SUCH ACCIDENTS IN, AN INCREASINGLY SATURATED AIRSPACE AND MIX OF AIRCRAFT. THERE IS NO SIMPLE SOLUTION, NOR IS THERE A TOTAL SOLUTIONTHAT WILL NOT BE COSTLY IN ONE WAY OR ANOTHER.

KEYWORDS : TA COLLISION WITH AIRCRAFT AIRBORNE ; DISSEMINATE SAFETY INFORMATION ; SEPARATION ; FLIGHT RULES ; TRAINING ; COMMUNICATION ATC ; PATTERNS ; TCA ; APPROACH CHARTS ; WARNING SYSTEMS ; LIGHTS ; CONDUCT STUDY ; EXPEDITE PROGRAM ; ATC PERSONNEL ; ATC SYSTEM ;; VEHICLE OPERATION; AIR TRAFFIC CONTROL; AIRPORTS; SYSTEMS; CREW MEMBERS

ITEM 7

ACCESSION NUMBER : 1403
GENERAL FILE CODE : 448
SPECIFIC FILE CODE : 448
FILE TYPE : RECOMMENDATION
RECOMMENDATION NO : 8-RE-7
ISSUE DATE : 670828
MODE : AVIATION

RECOMMENDATION SUBJECT : WE RECOMMEND, THEREFORE, THAT THE FEDERAL AVIATION ADMINISTRATION SURVEY THE TYPES OF GENERAL AVIATION AIRPLANES EQUIPPED WITH SOLID TYPE VISORS TO DETERMINE THE EXTENT

OF THE RESULTANT VISION IMPAIRMENT. WHERE IT IS FOUND THAT THEY SEVERELY HINDER THE PILOT'S VISION, THE SOLID VISOR SHOULD BE REPLACED BY A SEE-THROUGH TYPE. ADDITIONALLY, WE RECOMMEND THAT, IF THIS SURVEY SHOWS THE SOLID TYPEVISORS ADVERSELY AFFECT THE VISIBILITY FROM THE AIRCRAFT, PART 23 BEAMENDED TO PROVIDE THAT WHEN A SUN VISOR IS INSTALLED ON FUTURE AIRPLANES, IT BE A SEE-THROUGH TYPE IF IT CAN BE POSITIONED SO THAT IT EXTENDS INTO THE AREA OF VISION NECESSARY FOR COLLISION AVOIDANCE.

ACTION AGY/ORGANIZ : FAA

ACTION AGY RESP DUE : 671128

ACTION AGY ACTUAL RESP : 671109

NATURE OF AGY/ORG RESPONSE : WE ARE GOING TO SURVEY THE TYPES OF GENERAL AVIATION AIRPLANES EQUIPPED WITH OPAQUE SUN VISORS TO DETERMINE THE EXTENT OF THE RESULTANT VISION IMPAIRMENT. BASED ON THE RESULTS OF THIS SURVEY, WEWILL TAKE ACTION AS NECESSARY IN THE INTEREST OF SAFETY TO REPLACE THE OPAQUE SUN VISORS. THE INFORMATION OBTAINED WILL ALSO BE USED ASA BASIS TO SUPPORT ANY REGULATORY ACTION THAT MAY BE NEEDED TO ASSURE THAT SUN VISORS DO NOT DIMINISH ANGLES OF VISION BELOW VALUESREQUIRED FOR SAFE OPERATION. WE WILL FURNISH YOU COPIES OF THE RESULTS DERIVED FROM OUR ACTIONS ON THIS MATTER. IN ADDITION TO THE SURVEY, WE INTEND TO ISSUE AN ADVISORY CIRCULAR CONTAINING INSTRUCTIONS TO PILOTS ON THE JUDICIOUS USE OF SUN VISORS. IF THE RESULTS OF THE SURVEY SHOW THAT ANY CURRENTLY USED VISORS CREATE AN UNSAFE CONDITION, THIS ADVISORY CIRCULAR WILL BE FOLLOWED UP WITH THE ISSUANCE OF AIRWORTHINESS DIRECTIVES AS APPLICABLE.

STATUS OF REC(NTSB) : CLOSED - ACCEPTABLE ACTION

RECOM ABSTRACT : DURING OUR INVESTIGATION OF THE MIDAIR COLLISION BETWEEN BEECH BARON, N6127, AND TWA DC-9, N1063T, NEAR URBANA, OHIO, A SERIES OF PHOTOGRAPHS WERE TAKEN FOR US BY YOUR NAFEC FACILITIES FROM INSIDE THE COCKPIT OF A TWA DC-9 AND AN FAA BEECH BARON. IN REVIEWING THE PHOTOGRAPHS OF THE BEECH BARON, IT WAS NOTED THAT A CONSIDERABLE PORTION OF THE WINDOW AREA CAN BE BLANKED OUT BY THE SUN VISOR.

KEYWORDS : TA COLLISION WITH AIRCRAFT AIRBORNE ; PO EN ROUTE ; TO AIR CARRIER DOMESTIC ; TO GENERAL AVIATION ; TV FIXED WING ; DE HEAVY ; DE LIGHT ; DE MULTI-ENGINE ; CONDUCT STUDY ; REQUIRE MODIFICATION ; REVISE REGULATIONS ; AIRCRAFT AIRWORTHINESS STANDARDS ; SEPARATION ; WINDOW ; IMPAIRMENT ; FLIGHT RULES ;; AIR TRAFFIC CONTROL; STRUCTURES; CREW MEMBERS

Mr. DRIVER. Thank you very much. We will provide a copy.

Mr. BURTON. Have they replied?

Mr. DRIVER. The reply is here also. We have their recommendations and their reply and what we consider the status of the situation.

We have been encouraged by the continual strides which are being made in the air traffic control system to reduce the potential for catastrophic air collisions. The installation of the automated radar terminal system, called ARTS, and NAS Stage A are throughout the system, and the addition of conflict alert equipment in the center for approaches are an example of positive actions.

However, perhaps yesterday's accident indicates that these actions have not been enough. We have two mid-air collision accidents under active investigation. One occurred last May in Memphis. It involved a corporate jet which was conducting a pilot training flight. The jet had taken off from one runway and turned downwind to enter into another approach. It collided with a small aircraft, also a training flight, which was inbound to another runway. The accident thus has many common elements to yesterday's accident.

Both accidents involved a mix of aircraft having wide dispersions in performance.

Both accidents occurred in a terminal radar service area.

Both involved two aircraft operating off a different runway at a common facility, and in at least one aircraft, in both accidents, training was being conducted.

Mr. BURTON. Were they on the same frequency, though? Is that the only difference?

Mr. DRIVER. We think that is the only difference.

The pilot was probably on instruments, and may have been wearing an instrument hood of the type I described to Mr. English.

The see-and-avoid concept did not work even though weather was not a factor.

In the accident in May, the light aircraft was not equipped with a transponder. And although its primary target was seen on radar periodically, it was not part of an automatic tracing program. There was no conflict alert to alarm the controllers to issue an alarm or to direct an evasive maneuver.

Under these circumstances, neither BCAS nor DABS would have been effective in that particular case.

That accident caused us to believe that the criteria for transponder requirement should be reviewed. We believed that the accident might have been avoided if the light aircraft had been transponder equipped, and the facility had had a conflict alert capability.

Yesterday's accident has caused us to reevaluate that belief. The light airplane was transponder equipped. The facility did have conflict alert and it—apparently it—alarmed as was intended back at Miramar.

However, for one reason or another, that was not enough. BCAS or DABS does appear to be necessary, and as soon as possible. Now certainly until such systems are available, the nature of mixed operations and instrument training in the vicinity of airports served by commercial carriers should be reviewed.

A few weeks ago, sir, I appeared before the Ways and Means Committee, the Oversight Subcommittee with Mr. Gibbons. At that time the Board strongly supported the use of trust or ADAP funds for the development of instrument landing systems at the feeder and ancillary airports near the major airports that take the load off the major airports. This may have precluded small aircraft being required to practice instrument landings at a large airport where there is a mix of heavy, fast aircraft and small aircraft.

Mr. BURTON. That is something that passed my mind. They can find a different place to do it.

Mr. DRIVER. Yes, sir. The problem is, however, that you can't practice instrument approaches unless there is an instrument there.

It is for that reason, at least one of the reasons, the Board recommended that insofar as possible, particularly those fields that are used as feeder or relief airports, be equipped with proper vertical guidance equipment.

Mr. BURTON. I would like to point out that I do not think you should necessarily rethink your position on the Memphis crash about the necessity of the transponders because had there been a transponder—they were on the same frequency, but the person could have said, "Both of you look out." The fact that the Cessna had a transponder at least allowed the aircraft to get picked up on radar.

The problem is that somehow or other that Miramar picked up the conflict but did not get to PSA. Rather, we do not know whether it did or not, so I think there is really an apples and oranges discussion.

This accident does not destroy the NTSB position after the Memphis accident. We still don't know if the accidents would have been caused anyway but the fact that there was a transponder allowed Miramar to see a problem, and had PSA been on that frequency, perhaps the collision could have been avoided.

Mr. DRIVER. That is correct.

Mr. BURTON. You mentioned that manufacturers usually cooperate during accident investigations, and in releasing information you request.

"Usually" is, I guess, different than "always." Are there certain exemptions that you have or that they have? What is the understanding? What will they give you and what won't they give you?

Mr. DRIVER. I personally have not been privy to an occasion where the manufacturers refused to give information. I have noticed the reluctance on the part of some manufacturers to give the information as fast as we ask for it. I think that is the context in which this is written.

Mr. BURTON. In other words, they usually give it to you in a timely fashion, and sometimes you have to keep after them?

Mr. DRIVER. That is correct.

Mr. BURTON. The earlier witnesses brought up a case about the DC–10 accident in Los Angeles where information was not made available.

Mr. DRIVER. I think you were referring to the previous chart?

Mr. BURTON. Yes.

Mr. DRIVER. That did not bother us at the time because we felt that particular bit of information was not relevant to our investigation, so it did not bother us at that time.

Mr. BURTON. What reason did they give for not giving it to you?

Mr. DRIVER. Actually, we did not really ask for it.

Mr. BURTON. You did not ask them for the total document; is that right? Or did you not ask them for the part of the document that was deleted? Or did you say, "Give us the deleted document"?

Mr. DRIVER. Excuse me, Mr. Chairman—let me confer with my colleagues here.

Mr. BURTON. Certainly.

Mr. DRIVER. We got the information we needed, but we did not need that information which had been deleted as was shown on the chart.

Mr. BURTON. Did you ask for that information?

Mr. DRIVER. No, we did not. That is, we did not ask for the deleted part.

Mr. BURTON. How did you ask for the information? Let's assume it was File Chart 1–A. Did you ever ask for File Chart 1–A?

Mr. DRIVER. I was not down for that particular investigation. I do not know and neither does my staff know exactly how they asked for it, whether it was by chart form or by interview, or what.

Mr. BURTON. If all of that was relevant to look at, then I would assume that you would want to see what was deleted, or at least make them make a case to you as to why they could not tell you. I do not think they made that. But if you asked for it, you got nothing.

Mr. DRIVER. I will yield to my technical staff, Mr. Laynor.

Mr. LAYNOR. Mr. Chairman, in general in an accident investigation, the more specific we are as to the type of information we need from the manufacturer, the more it is to our advantage and to the advantage of the manufacturer. We seldom have any problems here. In fact, I do not recall any problems in getting information when we asked for it in a specific fashion.

In the course of our investigations, we ask for only that data that we feel we need to complete the accident investigation.

Mr. BURTON. You asked for that piece of paper?

Mr. LAYNOR. I do not recall the specifics behind that piece of paper.

Mr. BURTON. I am not trying to make a big deal out of that piece of paper. In effect, your testimony is that you do not have trouble getting the information that you seek from manufacturers; is that right?

Mr. LAYNOR. I know of no case where we have had trouble getting the information we seek.

Mr. BURTON. I see.

They never raise the issue with you of proprietary classification?

Mr. LAYNOR. I would not say "never." But I do not recall any specific incidents particularly involving air carrier aircraft. We have had, on occasion, general aviation manufacturers who have, for one reason or another, given us information that they said was proprietary.

Mr. BURTON. But they give it to you?

Mr. LAYNOR. Yes, sir.

We have been able to use it for accident investigation purposes, or we have not been able to release it.

Mr. BURTON. You heard the comments on CF–6 engines. Could you comment on your feelings about that and what your accident and incident files tell us about problems with high-bypass ratio engines?

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Also, I think you indicated that the engine was not tested in strict accordance with the appropriate advisory circular.

Mr. DRIVER. Mr. Chairman, with your permission, I would like to read a brief summary of our view of the CF–6 engine certification matter.

Our report of the accident involving the Overseas National Airways, Inc., Douglas DC–10 at JFK Airport in 1975 did, in fact, mention as a contributory factor the failure to consider the certain effects of damage due to foreign object ingestion when the engine was tested for certification. We did that in 1975.

Again, this analysis was conducted with the benefit of retrospect. The accident occurred when a wing-mounted CF–650 engine disintegrated and caught fire after ingesting seagulls during the aircraft's takeoff roll.

Even prior to this accident, Congressman Harley Staggers, as chairman of the Special Subcommittee on Investigations of the House Committee on Interstate and Foreign Commerce, requested a comprehensive review of the airworthiness of the CF–6 engine.

Our staff, in fact, supervised that review which included the evaluating of the adequacy of the FAA certification procedures relating to flying object ingestion and service difficulties experienced by the engines which use compressor blades with and without holes drilled into the tips to save weight.

These results were submitted to Congressman Staggers' subcommittee in March 1975. We found that there had been some controversy within the FAA about the CF–6 certification program.

The CF–6 was the first commercial turbo-fan engine which did not have anti-icing provisions and it was the only engine to use drilled fan blades. The controversy during the certification process was centered around methods used to demonstrate the capability of the engine to meet icing criteria rather than on the susceptibility of the engine to foreign object damage. We took issue with this.

During the certification process, the manufacturer presented a procedure to the FAA to show demonstration of the engine's capability to meet the flying object damage requirement of the applicable Federal regulation.

I think the people who went before us indicated that there was a regulation for the small old aircraft and one for the new ones.

Mr. BURTON. Is that a true statement? Do you agree with that statement?

Mr. DRIVER. Yes, that is a true statement. This is a new engine and a new everything else.

The procedure differed from an advisory circular which the FAA had issued as guidelines for the certification test. The manufacturer's basis for choosing an alternate procedure to that outlined in the advisory circular was that the advisory circular was oriented to the smaller, more conventional-size engine and, in some cases, the described tests were considered inappropriate for the CF–6. With little prior experience with large turbo fans used as guidelines, the procedure submitted by the manufacturer was approved as being reasonable and meeting the intent of the applicable Federal regulations by FAA.

The Safety Board has some reservations as to whether the tests which were actually conducted were as stringent as the test procedure contained in the advisory circular. Following the accident, we recommended that the FAA review the procedures and require a retest of the engine in accordance with the more stringent procedures.

The FAA reiterated their views that the certification tests met the intent of the regulations.

The actual mode of catastrophic failure in the accident was only indirectly associated with the nature of damage to the compressor blades caused by the bird ingestion. The failure which was precipitated by blade imbalance was not one which would be easily recognized through a failure in loads and effects analysis during design.

Whether it would have been made evident through more stringent tests is again conjecture. Now, the engine was modified after the accident and was subjected to special tests designed to produce an imbalance in the compressor. This modification was deemed satisfactory to preclude catastrophic failures such as occurred in the ONA accident.

Mr. BURTON. By whom? It was deemed by whom?

Mr. DRIVER. By FAA.

Mr. BURTON. I see.

Mr. DRIVER. As far as the drill blade tips, our review concluded that though the engine thus equipped is more susceptible to blade fragmentation damage, it should or will operate at an acceptable level of performance as specified in the regulations.

Furthermore, it was determined that there was no containment problem that would endanger the aircraft or its occupants. Therefore, the drilled blade issue was relegated to one of economics, that is, more susceptible to damage and more expensive to repair, rather than the issue dealing with airworthiness or safety.

That is the conclusion of our statement regarding CF–6.

Mr. BURTON. I wonder if you could build or use something in an airplane like a propeller, and not know whether it would work or not. That would be kind of spooky, wouldn't it?

Your comment was that the weakness probably would not have shown up in stress tests anyway.

Mr. DRIVER. This particular failure probably would not have shown up in the typical failure modes effective analysis. There are other techniques that might have picked it up like an indepth multi——

Mr. BURTON. Something that should be able to pick up any possible failures in something that vital; don't you think?

Mr. DRIVER. Most of these are picked up in flight certification or tests of the engine or the systems.

I think we have to accept the fact that some will get by because they are not discernible through a normal analysis or it could be engineering situations. We try to pick them up as soon as possible.

Mr. BURTON. Something has to be wrong with the process if something like that could happen.

I just have one question before I yield to my colleagues.

Pratt & Whitney—who certificated the JT9–D for them? A Pratt & Whitney person or an FAA person?

Mr. DRIVER. I do not know. Let me consult my staff.

I am informed, Mr. Chairman, that FAA, of course, approved the final certification.

Mr. BURTON. But after that the FAA uses industry people. Was it an industry person? Did he work for Pratt & Whitney? Did he work for the FAA?

Mr. DRIVER. I do not know.

Mr. BURTON. We can ask them.

That may or may not have bearing.

Mr. Walker?

Mr. WALKER. Thank you, Mr. Chairman.

You made the statement a little bit earlier that you have not directly recommended to FAA any particular kind of collision avoidance system. I think you said that you had not made a particular recommendation for BCAS. Is that correct?

Mr. DRIVER. You are about 90-percent correct.

What I stated was that the position of the Board was not to mandate either a ground or an airborne-type system or a particular type of system. What we are looking for is a system that would prevent the recurrence of that type of accident, whether it be airborne or ground.

We are familiar with the BCAS system and we are familiar with the DABS system. Both of them appear to have good potential for preventing the type of accidents that we have been witnessing in the last several years.

Mr. WALKER. According to the previous testimony, the FAA found that 13 of the 15 investigated midair collisions could have been prevented with the use of a BCAS system. That being the case with that kind of evidence on the record, do you not think that it may be necessary for organizations such as yours to begin to recommend specific kinds of technology that FAA should take under advisement?

Mr. DRIVER. We have a long list of recommendations for FAA to do something about collision avoidance. We have no such recommendations specifically pointing out the types of systems. We are very concerned about it, particularly since I think the time spent is about 10 years since FAA has been working on some type of system to do the job.

Mr. WALKER. I see.

Mr. DRIVER. Also, we can make recommendations only. We have no enforcement power. It is for that reason, perhaps, that we have lists of recommendations for which corrective action may not be appropriate as we would like it to be.

Mr. WALKER. That gets me back to the question I asked earlier this morning.

Do you have any feel at all for why FAA is being so intransigent about the idea of getting appropriate technology approved so that it can begin to be included on aircraft? Have you gotten any feel out of either the answers that you have gotten or the contacts that you have had on the subject as to why there has been an intransigence on the part of that agency?

Mr. DRIVER. I have no feel for it except that which an individual can pick out of reading the responses thereto. It could be that they are waiting for the development of better pieces of equipment. It could be the research idea.

Mr. WALKER. One of my colleagues this morning raised the spectre that perhaps bureaucracy itself was involved and that the FAA has a need to keep the bureaucracy operating and that certain kinds of systems might provide more job slots in the future.

Have you ever had any indication in the work that you have done that, in fact, what we could be seeing here is almost a classic case of not only bureaucratic mismanagement but actual disaster resulting from a bureaucratic entrenchment?

Mr. DRIVER. I cannot respond to that question.

Mr. WALKER. You do not know of anything that you have seen that would indicate that one way or the other?

Mr. DRIVER. No, sir.

Mr. WALKER. Thank you.

Mr. BURTON. Mr. Hightower?

Mr. HIGHTOWER. Thank you, Mr. Chairman.

Mr. Driver, at the beginning of your appearance this morning, we went right into the questions involving yesterday's accident.

You have a prepared statement. I wonder if you have anything that you want to add to your written prepared statement or to further elaborate on anything that has been included in your statement which we have not addressed thus far?

Mr. DRIVER. No, sir. The only addition I made to the prepared statement was that which addressed the collision avoidance systems.

Otherwise, I think the statement stands for itself. It is the Board's position.

Mr. HIGHTOWER. I see.

Have you, in the investigative role of your Board, run into any questions as to the proprietary interests or problems? Have you heard the comments about some of the manufacturers claiming trade secrets and proprietary confidentiality? Have you had any problems with that in accident investigation?

Mr. DRIVER. I think we have responded to that. We have had no problem with getting information.

There has been some information——

Mr. HIGHTOWER. I understood that previous response, but I wanted to zero in on the proprietary point.

Mr. DRIVER. Yes.

I stand to be corrected by my cohorts, but as I understand it, we do have access to some proprietary information. It is my understanding that we treat it as proprietary. I will ask Mr. Puls to respond.

Mr. PULS. I think we were speaking originally of aviation. We frankly have not had a major problem. As we have been expanding our efforts into the surface more and more, we are running into allegations that something is proprietary.

I am a little disturbed listening this morning to all of the discussion about this. I wish people would use the phrase "trade secret" because I think that is the thing that is really involved here.

I am not talking about aviation, but we have found in one area of a pipeline that there is a habit of companies to stamp everything "proprietary." When we ask them what they mean, they really don't know other than they own the piece of paper. So, when they give it to their attorneys to say, "Well, what is the trade secret?" usually we get the

whole thing back, and they have taken the proprietary stamp off.

But I would not say that is the case with manufacturers of aircraft because they feel very strongly that certain of their processes are trade secrets.

The FAA has to get at those through their process and generally we do not. We get the information, and if we get that piece of paper that is a true trade secret, we do our best to protect it because the law requires us to do so.

Mr. HIGHTOWER. That is the reason why I used both phrases in my question.

Along a similar line in connection with your investigations, do you have any problem of fear of legal liability being prematurely judged or exposed from the manufacturer's or operator's standpoint?

Mr. PULS. I am not sure I understand the question.

Mr. HIGHTOWER. In your investigations is cooperation limited for fear of legal liability? I refer to the possibility of law suits?

Mr. PULS. Let's say it is affected. I cannot sit here and say that we have been frustrated or limited because of the fear of litigation, but I would be naive to think that it does not have an impact.

If you are familiar with product liability litigation law today, you realize it has tremendous impact on the manufacturers.

I have answered the question, as I did several years ago, this way. The degree of cooperation we get from manufacturers in producing information and assisting us is remarkable when you consider the potential that they are involved in after an accident. That is the best I can say.

Mr. DRIVER. I would like to reinforce that statement. This may be the reason that there is a reluctance on the part of some manufacturers to give us the information that we have requested as far as we ask for it. It could be the reason, the litigation possibilities, the product liability, and so forth.

Mr. HIGHTOWER. One further question, Mr. Chairman, with regard to the proprietary claims and the trade secret issue.

Would it be of benefit to you in your investigative role to have a statutory definition of the proprietary rights of manufacturers?

I am talking about the limited area that you are involved in, that is, the investigation of the accidents.

Mr. DRIVER. I will call on my colleagues again, Mr. Chairman.

Mr. PULS. Congressman, I think it would be of greater assistance to the FAA than to our Board. If you can come up with a definition, then that would cover the situation and that would be helpful. I have gone through the exercise of having an attorney research recent law and proprietary information and trade secrets in specific. I cannot find an agreement between the courts, let alone the susceptibility to definition that would be helpful. I do not know how you do it really.

Mr. HIGHTOWER. We have had recent experience along that line legislatively. There are different concepts of it depending on the industry that you are addressing.

Thank you, Mr. Chairman.

Mr. BURTON. Mr. Butterworth? After these questions we will hear from the flight attendants and then we will break for lunch.

Mr. BUTTERWORTH. Let me once again set the stage for future witnesses. You heard the Air Line Pilots Association's description of

the fail passive autoland system and the decisions that the pilot would face in those visibility conditions.

I think we need to get the Board's comments on their comments. Do you associate yourselves with their views? More specifically, how do their views fit in with the "cockpit procedures study" mentioned in your written statement?

Mr. DRIVER. I did hear the Air Line Pilots Association's comments this morning. We are aware of their views regarding these issues. However, we do not believe that they can be discussed in the context of deficiencies in the aircraft type certification process. This is the deficiency in the context and substance of the regulations and the performance requirements themselves.

Rather they appear to be directed toward shortcomings in the standards governing certification.

Mr. BUTTERWORTH. Given that, do you have any other comments?

Mr. DRIVER. No; I do not think so.

Are we talking about the automatic landing system?

Mr. BUTTERWORTH. Yes.

Mr. DRIVER. Let me take a few moments on this.

The approval by the FAA for automatic landing systems in transport category aircraft is, in our opinion, a subject that would be more appropriately directed to examination of the adequacy and criteria.

This criteria is somewhat complex since it involves the certification of equipment on aircraft as well as the operations specifications for operators who seek approval for using the aircraft to III–A Minima.

Now approval may be sought for approach, as I indicated this morning, to a no-decision height or a 50-foot decision height, both requiring dependence on the aircraft equipment.

These standards are broad as defined in the Code of Federal Regulations. More definitive criteria is defined by advisory circulars.

One of these is directed toward an acceptable criteria for approval of the operation and another is directed toward a separate means of compliance with the broad standards of installation.

These advisory circulars are guidelines only leaving room for broad interpretation in the approval process.

Mr. BUTTERWORTH. Are the standards adequate or inadequate?

Mr. DRIVER. We cannot say at this time since very few category III operations have been conducted domestically. They have them overseas.

To be very frank, we have no firsthand accident or incident investigating experience upon which to base a judgment as to the adequacy of the criteria.

Mr. BUTTERWORTH. You do have accident or incident information on low-visibility approaches, though, so I assume you could extrapolate something from that.

Mr. DRIVER. Yes. We have quite a bit of accident experience in investigating accidents involving approaches under low visibility conditions, but we do not have enough accident investigation experience to judge the criteria that are established in the 50-foot and the 700-foot situation. I think even ALPA said that tests conducted by FAA went much farther than the 700-foot range visibility.

Mr. BUTTERWORTH. Have you ever advocated conducting other tests?

Mr. DRIVER. Not to my knowledge.

Mr. BURTON. All in all, it would beat what is going on now.

Mr. DRIVER. Yes.

Mr. BUTTERWORTH. A very important point is this. Do you agree that advisory circulars and notices and directives are as important a part of the standards which you criticize as the Federal Air Regulations themselves?

Mr. DRIVER. They are at least as important. Once they are out, even though they are not mandatory, the circulars do impinge upon the safety of aircraft. I say that they are just as important if not more so.

Mr. BURTON. How do they impinge if they are not mandatory?

They set out guidelines, and if you do that, can you wash your hands of the situation even though the guidelines are inadequate?

Mr. DRIVER. No.

What I meant was this: The changes or modifications proposed by the advisory circulars have a definite impact on safety inasmuch as they are supposed to correct the previous deficiencies.

Mr. BURTON. But they are not mandatory?

Mr. DRIVER. That is possible.

Mr. BURTON. What are they?

Mr. DRIVER. It is a guideline.

Mr. BURTON. If you are equal to the guideline, you can assume a legal defense of being safe, and if you are below the guideline, it doesn't matter because they are not mandatory, but just things you should do; is that correct?

Mr. DRIVER. Let me cogitate with my colleagues.

Mr. BURTON. It is simple. There are guidelines. They are not mandatory. If I am an airplane operator, or whatever it is, and if I am right up to the guideline—whatever the guideline is—if something happens with that plane, then my defense would be to say I have complied with the guideline; is that correct?

Mr. DRIVER. Mr. Chairman, I must admit that I was mixing up AD's with AC's. I will ask my cohort to my right to dig me out of this hole.

Mr. CLARKE. I am not sure I can.

FAA issues different types of advisory circulars. Most of them are of the information type where they are trying to get something out of the pilot community, or the manufacturing community, or whatever. These are strictly information-types of advisory circulars.

Mr. BURTON. About what type of information?

Mr. CLARKE. Something like—you could find one on wind sheer around airports. It is an information-type thing.

Those referenced by ALPA this morning and that have come up in connection with this CF–6 engine are a slightly different type. They are an advisory circular where FAA is listing for the world, if you will, an acceptable means of compliance.

Mr. BURTON. But it is not mandatory?

Mr. CLARKE. I agree.

Mr. BURTON. So we know what we are talking about. That is what we are talking about?

Mr. CLARKE. Yes.

Mr. BURTON. They are not mandatory?

Mr. CLARKE. That is right. They are not mandatory.

Mr. BURTON. So, therefore, the question is again this. If I meet that standard, do I have a legal defense by saying that I have done everything that has been legally required?

Mr. CLARKE. As I understand it, it works out in practice that this is an acceptable means of compliance to FAA in demonstrating compliance.

Mr. BURTON. What legal benefit does that provide for me?

Mr. CLARKE. That means that if you do not conform to that particular means of compliance, you are then required to demonstrate an equivalent level of safety for that listed in the advisory circular. You then have to make a showing to FAA that the means you are using are different from the ones in this advisory circular but are of equal safety.

Mr. BURTON. So, it is a guideline except if you can show that you can do things equally well or in a different way; is that right?

Mr. CLARKE. I am not sure I got that question.

Mr. BURTON. It sets a standard. That is a standard that all planes should meet.

However, if you can meet that standard in a different way, and if FAA approves that, then in that way you are still within the purview of that advisory circular; is that right?

Mr. CLARKE. You said a few things that I had difficulty going along with. One is that you said that they are standards. The advisory circulars are not standards.

Mr. BURTON. What is it, then? Is it a level of performance?

Mr. CLARKE. The type we are talking about represents a means of compliance to some other standard——

Mr. BURTON. So, it is a requirement.

Mr. CLARKE. It is a procedure.

Mr. BURTON. It is a procedure by which you comply with a standard.

If you do not meet the standard as set forth in a procedure, then you still may be in compliance with the standard by showing that you can accomplish the same goal in a different way. Is that right?

Mr. DRIVER. Mr. Chairman, we are having difficulty responding. I think I realize why.

Perhaps we are not the ones to respond to this question. Perhaps it should be FAA. I am not begging off.

Mr. BURTON. That is a good point. That is good enough for me.

If there are no further questions, gentlemen, we want to thank you very much.

[Mr. Driver's prepared statement follows:]

PREPARED STATEMENT OF ELWOOD T. DRIVER, ACTING CHAIRMAN, NATIONAL TRANSPORTATION SAFETY BOARD

MR. CHAIRMAN, MEMBERS OF THE COMMITTEE:

I AM ELWOOD T. DRIVER, ACTING CHAIRMAN OF THE NATIONAL TRANSPORTATION SAFETY BOARD. WITH ME ARE MARTYN V. CLARKE, DIRECTOR, BUREAU OF TECHNOLOGY, MR. WILLIAM G. LAYNOR, BUREAU OF TECHNOLOGY, MR. FRITZ PULS, GENERAL COUNSEL.

AS WE UNDERSTAND FROM YOUR LETTER, A PURPOSE OF THIS HEARING IS TO EXPLORE THE FAA CERTIFICATION PROCEDURES AND THE POSSIBILITY OF ALLOWING OUTSIDE PARTIES TO PARTICIPATE IN THESE PROCEEDINGS. YOU ARE INTERESTED IN THE BOARD'S VIEWS SINCE WE USE PARTIES IN INVESTIGATIONS.

AS YOU KNOW, SECTION 304(A)(1) OF THE INDEPENDENT SAFETY BOARD ACT OF 1974 CHARGED THE NATIONAL TRANSPORTATION SAFETY BOARD WITH ACCIDENT INVESTIGATION AND DETERMINATION OF PROBABLE CAUSE IN TRANSPORTATION ACCIDENTS.

THE SAFETY BOARD HAS A DESIGNATED AVIATION "GO TEAM" READY TO LEAVE FOR THE SCENE OF A MAJOR ACCIDENT AT A MOMENT'S NOTICE. THE "GO TEAM" IS MANNED WITH BOARD PERSONNEL, EACH KNOWLEDGEABLE IN A SPECIFIC TECHNICAL AREA SUCH AS OPERATIONS, SYSTEMS, STRUCTURES, METEOROLOGY, HUMAN FACTORS AND AIRWAYS

TRAFFIC CONTROL. THESE PERSONNEL BECOME THE CHAIRMEN OF WORKING GROUPS IN THE VARIOUS AREAS.

THE WORKING GROUPS ARE COMPOSED OF TECHNICALLY QUALIFIED REPRESENTATIVES OF PARTIES WHO HAVE PRESENTED THEIR CREDENTIALS TO THE INVESTIGATOR-IN-CHARGE (IIC) ON ARRIVAL AT THE SCENE. THE PARTIES ARE USUALLY THE INVOLVED AIRCRAFT OPERATOR, AIRCRAFT AND COMPONENT MANUFACTURERS, AND ASSOCIATIONS OF PERSONNEL INVOLVED IN THE OPERATIONS AND MAINTENANCE OF THE AIRCRAFT. THEY ARE INCLUDED, AT THE DISCRETION OF THE NTSB, TO ASSIST IN THE DISCOVERY OF FACTS ASSOCIATED WITH THE ACCIDENT. BECAUSE OF LIMITED BOARD RESOURCES WE WELCOME SUCH PARTICIPATION AND FIND IT NECESSARY IN ORDER TO HAVE THE BEST TECHNICAL EXPERTISE AVAILABLE. FOR INSTANCE, THOSE MOST FAMILIAR WITH THE AIRPLANE DESIGN OR MOST KNOWLEDGEABLE IN OPERATIONS OR AIR TRAFFIC CONTROL, OR BEST QUALIFIED ON OTHER FACTORS RELEVANT TO THE ACCIDENT, MAY BE ASSOCIATED WITH A PRIVATE GROUP. IN MANY CASES THESE GROUPS HAVE UNIQUE EXPERTISE. THEY ARE ALSO ALLOWED TO PARTICIPATE DURING PUBLIC HEARINGS WHICH ARE OFTEN HELD AS PART OF THE INVESTIGATIVE PROCESS. ALTHOUGH THE FACTUAL REPORTS ARE WRITTEN BY NTSB GROUP CHAIRMEN, PRIVATE PARTY REPRESENTATIVES ARE ALLOWED TO COMMENT AND SUGGEST CHANGES BEFORE REPORTS ARE MADE PART OF THE PUBLIC RECORD.

THE PARTIES ARE ALSO INVITED TO SEND IN THEIR ANALYSES OF THE EVIDENCE GATHERED DURING THE INVESTIGATIVE STAGE, THEIR RECOMMENDATIONS OF PROBABLE CAUSE, AND THEIR RECOMMENDATIONS FOR ACCIDENT PREVENTIVE MEASURES. SUCH COMMENTS ARE MADE PART OF THE PUBLIC RECORD.

COLLABORATION DURING THE INVESTIGATIVE STAGES NOTWITHSTANDING, BOARD PERSONNEL CONDUCT THE REVIEW AND ANALYSIS OF THE EVIDENCE WITHOUT DIRECT PARTICIPATION OF OUTSIDE PARTIES. HOWEVER, ANY ANALYSIS SUBMITTED BY THE PARTIES WILL BE CONSIDERED BY THESE BOARD PERSONNEL.

THE VARIOUS STAGES OF THE REPORT WRITING, FROM THE INITIAL DRAFT THROUGH TO THE FINAL, ARE ACCOMPLISHED BY BOARD STAFF. THE FINAL DRAFT IS DELIVERED TO THE FIVE-MEMBER BOARD WHICH REVIEWS, DISCUSSES, AND ACTS ON IT IN A MEETING OPEN TO THE PUBLIC. THE FINAL DETERMINATION OF PROBABLE CAUSE AND THE RECOMMENDATIONS ARE VOTED UPON IN THIS OPEN MEETING AND APPROVED OR DISAPPROVED BY MAJORITY RULE.

CONCERNING THE HANDLING OF CONFIDENTIAL DATA, THE BOARD ROUTINELY REQUESTS INFORMATION ABOUT AIRCRAFT DESIGN AND PRACTICES FROM MANUFACTURERS AS PART OF THE INVESTIGATION. THE MANUFACTURERS HAVE COOPERATED IN ALMOST EVERY CASE. VERY SELDOM HAVE THEY DESIGNATED INFORMATION AS PROPRIETARY OR AS

TRADE SECRETS. HOWEVER, IF INFORMATION OBTAINED BY THE BOARD IS IDENTIFIED AS A TRADE SECRET IT MAY NOT BE RELEASED UNDER THE LAW.

THE PARTICIPATION OF OUTSIDE PARTIES WORKS WELL FOR THE BOARD'S PURPOSES BECAUSE THEY BRING TO THE INVESTIGATION RESOURCES AND EXPERTISE THAT WOULD BE ECONOMICALLY IMPOSSIBLE FOR THE BOARD TO SUPPLY. HOWEVER, WE CANNOT EXTRAPOLATE OUR EXPERIENCE TO THE CERTIFICATION PROCESS AS WE ARE NOT NORMALLY CONCERNED WITH AND, IN FACT, LACK EXPERTISE IN THE PARTICULAR ECONOMIC AND ORGANIZATIONAL CONSEQUENCES WHICH MAY BE THE CENTRAL ISSUES IN THIS MATTER. ON THE RELATIONSHIP BETWEEN THE CERTIFICATION PROCESS AND HAZARDS TO AVIATION SAFETY, THE BOARD HAS SELDOM FOUND THAT THE PROCESS PER SE HAS BEEN THE DIRECT CAUSE OF ACCIDENTS. INDEED, IT MAY BE THAT THE EXCELLENT SAFETY RECORD COMPILED BY AMERICAN TRANSPORT TYPE AIRCRAFT COULD BE PARTIALLY ATTRIBUTED TO THE CERTIFICATION PROCESS. THE BOARD BELIEVES THAT INADEQUATE STANDARDS OR THE ABSENCE OF STANDARDS, WHICH ARE THE BASIS FOR CERTIFICATION, ARE OFTEN THE CAUSE OR FACTORS IN ACCIDENTS. IT IS HERE THAT ATTENTION COULD BE FOCUSED.

THE SAFETY BOARD'S RECOMMENDATIONS ARE OFTEN DIRECTED TOWARD UPGRADING THOSE STANDARDS. THE BOARD HAS MADE RECOMMENDATIONS IN THE FOLLOWING AREAS, TO NAME A FEW:

THE CF-6 ENGINE BIRD INGESTION TESTS
THE DC-10 CARGO DOOR
CABIN FLOOR VENTING
TIRE PERFORMANCE STANDARDS AND CERTIFICATION TEST REQUIREMENTS
DESIGN STRENGTH OF SEATS
SPOILER OR GROUND DECELERATION DEVICE DEPLOYMENT
COCKPIT VOICE AND FLIGHT DATA RECORDERS, AND
FLIGHT INSTRUMENTATION

- AS A RESULT OF A COMPREHENSIVE REVIEW OF THE AIRWORTHINESS OF THE CF-6 ENGINE AND AFTER AN ACCIDENT INVOLVING THE ENGINE, THE SAFETY BOARD HAD SOME RESERVATIONS AS TO WHETHER THE TESTS WHICH WERE ACTUALLY CONDUCTED WERE AS STRINGENT AS THE TEST PROCEDURE CONTAINED IN THE ADVISORY CIRCULAR AND, FOLLOWING THE OVERSEAS NATIONAL ACCIDENT, WE RECOMMENDED THAT THE FAA REVIEW THE PROCEDURES AND REQUIRE RETEST OF THE ENGINE IN ACCORDANCE WITH THE MORE STRINGENT PROCEDURES. THE ENGINE WAS MODIFIED AFTER THE ACCIDENT AND WAS SUBJECTED TO SPECIAL TESTS DESIGNED TO PRODUCE AN IMBALANCE IN THE COMPRESSOR SECTION. THE MODIFICATION WAS DEEMED SATISFACTORY TO PRECLUDE CATASTROPHIC FAILURE SUCH AS OCCURRED IN THE ONA ACCIDENT.

AS FAR AS ABSENCE OF STANDARDS IS CONCERNED, THE BOARD QUESTIONS THE ADEQUACY OF THE PRESENT STOPPING DISTANCES AND

ACCELERATE-STOP DISTANCE DATA WHICH ARE DEVELOPED DURING CERTIFICATION AS IT APPLIES TO WET RUNWAYS. FRANKLY, THERE ARE NO DATA. THE DATA ARE PRESENTLY DEVELOPED ON DRY RUNWAYS.

FOR OPERATIONAL USE, AN ALLOWANCE IS APPLIED TO DRY RUNWAY DATA TO DETERMINE THE DISTANCE REQUIRED FOR AN AIRCRAFT TO LAND ON A WET RUNWAY. THE ALLOWANCE IS ACTUALLY A 15 PERCENT INCREASE OVER THE DRY RUNWAY DISTANCE. IT IS ARBITRARY AND NOT BASED UPON CERTIFICATION TESTS. ALSO, THIS INCREASED REQUIREMENT IS FOR DISPATCH PURPOSES ONLY. THERE IS NO WET RUNWAY ALLOWANCE APPLIED TO ACCELERATE-STOP DATA FOR TAKEOFF DISTANCE AND REJECTION SPEEDS. THEREFORE, THE RUNWAY DISTANCE WHICH AN AIRCRAFT HAS AVAILABLE FOR STOPPING AFTER REJECTING A TAKEOFF AT A CALCULATED REJECTION SPEED IS PREDICATED UPON DRY CONDITIONS. THIS DISTANCE MAY BE INSUFFICIENT WHEN FRICTIONAL COEFFICIENTS ARE REDUCED DURING WET CONDITIONS. THE BOARD, THEREFORE, BELIEVES THAT RUNWAY PERFORMANCE STANDARDS SHOULD BE REVISED TO ACCOUNT FOR WET RUNWAY CONDITIONS.

THE AUTOMATIC LANDING SYSTEM IS ANOTHER CONCERN OF SOME. IN OUR OPINION, IT IS NOT THE SYSTEM ITSELF THAT PERTAINS TO AIRCRAFT CERTIFICATION, BUT RATHER THE OPERATIONAL STANDARDS WHICH GOVERN THE USE OF THE ALS. THE STANDARDS ARE BROAD AS SPECIFIED IN THE CODE OF FEDERAL REGULATIONS. MORE DEFINITIVE

CRITERIA ARE PROMULGATED BY ADVISORY CIRCULARS. ONE ADVISORY CIRCULAR IS DIRECTED TOWARD AN ACCEPTABLE CRITERIA FOR APPROVAL OF THE OPERATION, AND ANOTHER IS DIRECTED TOWARD AN ACCEPTABLE MEANS OF COMPLIANCE WITH THE BROAD STANDARDS FOR INSTALLATION APPROVAL OF THE AUTOMATIC LANDING SYSTEM THEMSELVES. HOWEVER, THESE ADVISORY CIRCULARS ARE GUIDELINES ONLY, LEAVING ROOM FOR BROAD INTERPRETATION IN THE APPROVAL PROCESS.

THE SAFETY BOARD IS CONCERNED ABOUT THE ISSUANCE OF APPROVAL FOR APPROACHES TO THE 50-FOOT DECISION HEIGHT CATEGORY III-A MINIMA WHERE THE ONLY REDUNDANCY IS THE PILOT. A FAILURE WOULD REQUIRE IMMEDIATE PILOT RECOGNITION AND ACTION, AND PERFECT FLIGHTCREW COORDINATION. THESE VIEWS WERE EXPRESSED IN OUR SPECIAL STUDY, "FLIGHTCREW COORDINATION PROCEDURES IN AIR CARRIER INSTRUMENT LANDING SYSTEM APPROACH ACCIDENTS," ISSUED IN AUGUST 1976.

RECENTLY, AS THE RESULT OF THE INVESTIGATION INTO THE CONTINENTAL AIR LINES DC-10 ACCIDENT IN LOS ANGELES ON MARCH 1, 1978, THE BOARD ISSUED SEVERAL RECOMMENDATIONS ON AIRCRAFT TIRES. THESE INCLUDED THE UPGRADING OF TECHNICAL STANDARD ORDER C-62 TO REFLECT CURRENT ENGINEERING PRACTICES AND OPERATIONAL CONDITIONS. BOTH THE SPECIFICATIONS FOR

PERFORMANCE STANDARDS AND CERTIFICATION TEST REQUIREMENTS, AND TIRE/AIRFRAME COMPATIBILITY DURING AIRPLANE CERTIFICATION WERE INVOLVED.

THE BOARD CONCLUDES THAT THE EFFECTIVENESS OF THE CERTIFICATION PROCESS IS LARGELY DEPENDENT UPON THE ADEQUACY OF THE STANDARDS.

TO USE AN AUTOMOBILE MANUFACTURING SIMILE AS AN ILLUSTRATION, THE ASSEMBLY LINE IS ONLY AS GOOD AS THE PIECES THAT ARE FED INTO IT. TO HAVE A GOOD END PRODUCT, THE INDIVIDUAL PIECES MUST BE FASHIONED CORRECTLY TO FULFILL THEIR PURPOSES. THUS WITH THE CERTIFICATION PROCESS, THE STANDARDS MUST BE ADEQUATE AND CONSTANTLY UPGRADED AS OPERATIONAL EXPERIENCE IS GAINED.

MR. CHAIRMAN, YOU ALSO ASKED US TO DISCUSS THE SUBJECT OF "DRY LEASE."

AS YOU KNOW, A LEASE, FOR THE PURPOSE OF FAR PART 91.54, MEANS ANY AGREEMENT BY A PERSON TO FURNISH AN AIRCRAFT TO ANOTHER PERSON FOR COMPENSATION OR HIRE. THE LEASING OF AN AIRCRAFT WITHOUT A CREW IS CONSIDERED TO BE A "DRY LEASE." NORMALLY, IN THE CASE OF A "DRY LEASE," THE LESSEE EXERCISES

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OPERATIONAL CONTROL OF THE AIRCRAFT. "OPERATIONAL CONTROL" IS DEFINED IN THE FEDERAL AVIATION REGULATIONS AS THE EXERCISE OF AUTHORITY OVER INITIATING, CONDUCTING OR TERMINATING A FLIGHT. IN OTHER WORDS, THE LESSEE IS RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL AVIATION REGULATIONS, WHICH INCLUDES AIRCRAFT MAINTENANCE AND PILOT PROFICIENCY.

IT IS THE INTENT OF THE REGULATION THAT THE PROSPECTIVE LESSEE SHOULD BE MADE AWARE OF HIS RESPONSIBILITIES AS AN OPERATOR OF AN AIRCRAFT. TO ASSURE THIS, FAR PART 91.54 REQUIRES THAT A TRUTH IN LEASING CLAUSE, IN LARGE PRINT, SHALL BE INCLUDED AS THE CONCLUDING PARAGRAPH IN THE CONTRACT. IN ADDITION TO THE TRUTH IN LEASING CLAUSE, FAR PART 91.54 REQUIRES THAT THE LESSEE OR CONDITIONAL BUYER MAIL A COPY OF THE LEASE OR CONTRACT TO THE FAA FLIGHT STANDARDS TECHNICAL DIVISION IN OKLAHOMA CITY WITHIN 24 HOURS OF ITS EXECUTION. A RECENT AMENDMENT FURTHER REQUIRES THAT THE LESSEE OR CONDITIONAL BUYER NOTIFY (IN PERSON OR BY TELEPHONE) THE APPROPRIATE FAA OFFICE NEAREST THE AIRPORT WHERE THE FLIGHT WILL ORIGINATE, AT LEAST 48 HOURS PRIOR TO THE FIRST TAKEOFF OF THE FLIGHT.

THE CAB DESCRIBES A "WET LEASE" AS A LEASE IN WHICH THE LESSOR PROVIDES BOTH THE AIRCRAFT AND THE FLIGHTCREW. UNDER

THE CONDITIONS OF A "WET LEASE" THE LESSOR EXERCISES OPERATIONAL CONTROL OF THE AIRCRAFT. MOST CHARTER FLIGHTS ARE CONTRACTED FOR BY EDUCATIONAL, SOCIAL, FRATERNITY, OR BUSINESS GROUPS UNDER THE TERMS OF A "WET LEASE." THESE COMPANIES HOLD A VALID FAA OPERATING CERTIFICATE, PROVIDE A PROPERLY MAINTAINED AIRCRAFT, AND A PROPERLY TRAINED AND QUALIFIED CREW. THE LARGE AIRCRAFT USED ARE REQUIRED TO COMPLY WITH THE APPLICABLE CERTIFICATION AND OPERATING RULES OF FAR PART 121 GOVERNING AIR CARRIERS AND COMMERCIAL OPERATORS.

THESE REGULATIONS APPEAR ADEQUATE. UNFORTUNATELY, THERE ARE A FEW COMPANIES OR INDIVIDUALS WHO HAVE NO OPERATOR'S CERTIFICATE BUT WHO ARE WILLING, FOR THE SAKE OF PROFIT, TO VIOLATE THE LAW BY EVADING SAFETY REQUIREMENTS. THEY DO THIS BY THE USE OF DEVIOUS LEASES AND CONDITIONAL SALES CONTRACTS. OUR ACCIDENT INVESTIGATIONS HAVE SOMETIMES REVEALED A PRACTICE OF SUBTERFUGE, USING TWO OR MORE COMPANIES, CLOSELY AFFILIATED OR ACTUALLY OWNED BY THE AIRCRAFT OWNER. ONE COMPANY LEASES THE AIRPLANE; ANOTHER CONTRACTS FOR THE CREWS. BECAUSE THE AIRCRAFT LESSOR IS NOT TECHNICALLY PROVIDING A CREW, THE CONTRACT COULD BE CONSIDERED A "DRY LEASE." THE LESSEE IS THEN RESPONSIBLE FOR THE OPERATIONAL CONTROL AND, IN MOST CASES, IS TOTALLY IGNORANT OF AIRCRAFT OPERATIONS AND PROCEDURES AND OF FEDERAL AVIATION REGULATIONS. THE LESSOR "WASHES HIS

HANDS" OF ALL RESPONSIBILITIES, SAVING MONEY IN MAINTENANCE COSTS, ETC. THE LESSEE BELIEVES HE IS CONTRACTING FOR SAFE TRANSPORTATION FOR HIS GROUP, JUST LIKE HIRING A BUS. TO CARRY THE BUS SIMILE A LITTLE FURTHER, NO GROUP IN THEIR RIGHT MIND WOULD CHARTER A BUS IF THEY KNEW THAT THEY WOULD BE LIABLE FOR ANY VIOLATION IN MAINTENANCE, DRIVER QUALIFICATION OR TRAFFIC CODES. THE BOARD BELIEVES THAT NO GROUP WOULD LEASE AN AIRCRAFT IF THEY REALIZED THE RAMIFICATIONS OF A "DRY LEASE."

ANOTHER SUBTERFUGE USED BY OPERATORS IS THE CONDITIONAL SALES CONTRACT. IF A PERSON, GROUP OR BUSINESS OWNS AN AIRCRAFT, THE CARRIAGE OF THEIR OWN PERSONNEL OR GOODS IS NOT CONSIDERED A COMMERCIAL OPERATION FOR COMPENSATION OR HIRE. SUCH OPERATIONS THEREFORE DO NOT REQUIRE A CERTIFICATE AND CAN OPERATE UNDER FAR PART 91, SUBPART D. THE PROVISIONS OF THIS SUBPART ARE NOT AS EXACTING AS THOSE COVERING THE CARRIAGE OF PERSONS AND PROPERTY FOR COMPENSATION OR HIRE. WHEN AN AIRCRAFT IS PURCHASED UNDER A CONDITIONAL SALES CONTRACT, POSSESSION IS DELIVERED TO THE CONDITIONAL BUYER. SOME GROUPS SEEKING CHARTER SERVICES MAY KNOWINGLY ENTER INTO AN EVASIVELY WORDED ARRANGEMENT, IF THE PRICE IS MADE ATTRACTIVELY LOW. A GROUP COULD BE TALKED INTO A CONDITIONAL SALES CONTRACT FOR THE DURATION OF THE PERIOD THE AIRCRAFT IS REQUIRED AT THE

END OF THE PERIOD, THE CONDITIONAL BUYER, IN EFFECT, DROPS HIS OPTION AND FORFEITS HIS MONEY WHICH PROBABLY WOULD BE LESS THAN THE COST OF A LEASE FROM A BONA-FIDE COMPANY.

AS WE STATED BEFORE, THE CURRENT REGULATIONS APPEAR ADEQUATE. HOWEVER, THE WEAKEST LINK IN THE LEASING CHAIN IS THE LESSEE. HE IS THE ONE WHO NEEDS TO BE EDUCATED ON THE PITFALLS OF LEASING AN AIRCRAFT. ON JANUARY 16, 1978, THE FAA ISSUED ADVISORY CIRCULAR 91-37A, "TRUTH IN LEASING." THIS ADVISORY CIRCULAR IS AN EXCELLENT TOOL FOR ANY PERSON CONTEMPLATING THE LEASE OF AN AIRCRAFT. UNFORTUNATELY, THE AVERAGE PERSON OUTSIDE THE AVIATION INDUSTRY DOES NOT KNOW THAT ADVISORY CIRCULARS EXIST. THEREFORE, THE BOARD SUGGESTS THAT A COPY OF AC 91-37A BE A REQUIRED ATTACHMENT TO EVERY LEASE, CONTRACT, OR CONDITIONAL SALES CONTRACT, WITH THE FURTHER REQUIREMENT THAT THE LESSEE ATTEST THAT HE HAS READ AND UNDERSTANDS THE CONTENTS OF THE AC.

ALSO, AS THE BOARD HAS RECOMMENDED AND SUGGESTED SINCE 1970, THE FAA SHOULD UNDERTAKE A BETTER SURVEILLANCE PROGRAM AND A MORE VIGOROUS ENFORCEMENT OF EXISTING RULES.

MR. CHAIRMAN, I AM AVAILABLE FOR FURTHER DISCUSSION AS YOU DESIRE.

THANK YOU.

Mr. BURTON. We will now hear from Patricia Robertson, president, Association of Flight Attendants.

STATEMENT OF PATRICIA D. ROBERTSON, PRESIDENT, ASSOCIATION OF FLIGHT ATTENDANTS; ACCOMPANIED BY DEL MOTT, DIRECTOR OF SAFETY; AND MYA SHELTON, CHAIRPERSON, AIRCRAFT TECHNICAL COMMITTEE

Ms. ROBERTSON. Thank you, Mr. Chairman. I am Patricia Robertson, president of the Association of Flight Attendants, or AFA, which represents 18,000 professional flight attendants.

With me today is Del Mott, our director of air safety, and Mya Shelton, Aircraft Technical Committee chairperson, who are here to assist me in any questions you may have of a technical nature.

I am very grateful for this opportunity to present our views to this committee. I must also commend the committee for taking up the issue of aircraft certification and for realizing that it is not simply a matter of procedural efficiency that we are talking about today, but, more importantly, a matter of safety and concern for human life.

The following account is but one example that directly involves the safety of passengers and flight attendants aboard commercial aircraft. It illustrates the vital necessity for user input and participation in the aircraft certification process. Other examples are being submitted for the record.

Mr. BURTON. Without objection, the other examples submitted will be inserted in the record. [See pp. 154–263.]

Ms. ROBERTSON. However, for the sake of brevity, we wish to depict one specific example to illustrate that, if there had been greater cooperation and openness on the part of the FAA in the cited case, a great deal of time and energy could have been saved and a safer aircraft could have been delivered directly from the production line.

This account deals with the certification of a jumbo aircraft, the DC–10 Convertible Freighter, or the DC–10–CF. As a point of explanation, all jumbo aircraft, which include regular DC–10's, 747's, and L–1011's, were introduced into service without any regulations governing the lower galley compartments below the passenger cabin. There were no regulations governing the elevator systems—known as lifts—which transport personnel from one level to the other, and no regulations for emergency escape systems from the lower compartment.

However, one feature which was designed into the lower galley compartment of the jumbo aircraft and certificated by the FAA was an emergency escape hatch. This emergency escape hatch route leads from the lower galley compartment to a manual hatch, which, when opened by personnel in the lower compartment, affords escape into the aisle areas of the aircraft. This feature was designed into these jumbo aircraft in case of a mechanical or electrical failure of the personnel lift or the food cart lift; or in the event of an electrical shutdown.

Additionally, it was also designed to permit access from the passenger compartment to the lower compartment, particularly for emergency situations.

The electrically powered lifts, however, could not be considered as escape areas—even with backup electrical systems—due to the fact that, in the event of electrical failure, mechanical failure, or engine shutdown, the lifts would not operate. Therefore, the manual escape hatch from the lower galley was designed.

In contrast to the other jumbo aircraft, prior to certification and delivery, the DC–10–CF was designed and built without a manual emergency escape hatch. In order for flight attendants to escape from the lower galley, it was assumed that the backup electrical system would suffice. No one gave thought to a malfunction of the backup electrical system or a mechanical failure, or that both lifts might be up at the passenger level and not down in the galley.

I am giving you this information after the fact because, if it had not been for rumors, the persistent efforts of our own safety representatives, and our followup on these suspicions, we could not have known the facts, and, consequently, the DC–10–CF would have gone into operation without a manual escape hatch.

In December of 1972, before the DC–10–CF had been certificated by the FAA, Mya Shelton, AFA Aircraft Technical Committee chairperson, heard, by way of the grapevine, second- or third-hand, that a DC–10–CF would be built with no manual backup means of escape from the lower galley to the passenger compartment. This emergency escape hatch was currently in use on all other jumbo-type aircraft with lower galleys. Certainly, we felt that the FAA would not allow such an unsafe measure. But we decided to check it out which Ms. Shelton did.

On January 9, 1973, Ms. Shelton wrote to Mr. Wayne Garrison of the Air Carrier Branch of the FAA in the western region, questioning the validity of what she had heard relative to the DC–10–CF. About the same time, our national office called the FAA Airframe Branch here in Washington, D.C., to determine if such an aircraft was indeed being built.

Our response from the Washington FAA was that they were not aware of such an aircraft.

On February 1, 1973, Mr. Garrison answered Ms. Shelton's letter, stating in part:

> There have been many discussions with the McDonnell Douglas Corp. (builders of the aircraft) regarding the lower galley emergency escape hatch. However, to date, no formal presentation has been made. You can be assured that an equivalent level of safety will be provided and required prior to approval being given to any design.

Thirteen days later we learned from our Overseas National Airways flight attendant representatives that ONA was to receive delivery of the DC–10–CF in the latter part of April and that this aircraft, in fact, would not have an emergency escape hatch.

On February 15, 1973, our office wrote to Mr. Nelson Shapter, then chief of the Airframe Branch of the FAA. We again asked for information concerning the DC–10–CF and questioned the lack of an escape hatch.

In the interim, ONA was training their flight attendants on the DC–10–CF and advising that it, and I quote: "if trapped in the galley with both lifts inoperative, remain in the galley until the aircraft stops, at

which time 'someone' would have to get you out through the cargo door." This door is located in a separate compartment aft of the lower galley compartment.

Our association was not content with settling for such minimal levels of safety. We had sufficient evidence concerning lift malfunctions that we did not trust the lifts as an adequate escape route, and the training by ONA confirmed the fears that we had.

Our concern, Mr. Chairman, compelled us to exert every pressure to prevent the introduction into the air transport system of a jumbo aircraft not equipped with an emergency escape hatch so vital to any occupants of sealed compartments below the passenger compartment.

The meetings and letters generated by our association proved to be fruitless. We discovered that, on April 17, 1973, the FAA had certificated the DC–10–CF without a lower manual emergency escape hatch. We previously notified the FAA that, while our flight attendants and pilots would fly aboard the aircraft, they would not enter the lower galley compartment until such time as the manual emergency escape hatch was built. Then, on April 17, 1973, ALPA and AFA notified ONA of the same information. Six days after that, ONA informed us that a manual escape hatch would indeed be built into the DC–10–CF.

Mr. Chairman, at this point, I would like to request that we be permitted to submit, for the record, our chronology of the meetings, letters, and telephone conversations concerning this matter between March 9, 1973, and April 23, 1973. These transactions are pertinent to the record.

Mr. BURTON. Without objection, this material will be included in the record at this point.

[The material follows:]

CHRONOLOGY OF AFA ACTIVITIES CONCERNING DC-10-CF

SUBMITTED FOR THE RECORD

ACTIVITIES BETWEEN MARCH 9, 1973 and APRIL 23, 1973

On March 9 and 20, 1973, Ms. Shelton and Mrs. Mott met with the FAA Western Region concerning this matter and continued to request that a manual escape hatch be installed in the DC-10-CF.

On March 12, 1973, we requested a meeting with Douglas Aircraft to attempt to resolve the matter with them prior to certification and delivery. Additionally, the ONA AFA representatives, by letter, contacted their respective officials, including the pilot representatives, in an effort to emphasize the importance of the emergency escape hatch as an alternate escape route from the lower galley compartment.

During the latter part of March, 1973, Mr. Shapter of the FAA Engineering Branch in Washington, wrote to our National Headquarters assuming that our meetings with the FAA Western Region "had satisfied our needs." On April 10, 1973, our National Office wrote Mr. Shapter informing him and the FAA Western Region that, in fact, the meetings with FAA had not been satisfactory under any conditions. On April 10, 1973, a telegram was sent to FAA Western Region requesting full information concerning the possible certification of the DC-10-CF, names of certificating officials, and questioning whether it had, in fact, been certificated without a manual escape hatch.

On April 13, 1973, Ms. Shelton and the AFA ONA representative met with the FAA and Douglas Aircraft concerning the lack of manual escape system from the lower galley compartment of the DC-10-CF.

On April 13, 1973, the President of the Air Line Pilots Association, with the support and backing of the Overseas National pilot and flight attendant safety representatives and the AFA National Office, wrote to Mr. Butterfield, Administrator of the FAA, stating that, if the FAA were to certificate the DC-10-CF without an emergency escape hatch from the lower galley compartment to the main deck of the aircraft, the pilots and flight attendants would not enter into the lower galley until such time as a manual escape hatch was installed.

On April 17, 1973, FAA Western Region certificated the DC-10-CF without an emergency escape hatch from the lower galley compartment. AFA and ALPA were notified of such by letter dated May 9, 1973 from Mr. James Rudolph, then Director of Flight Standards.

FAA did not alter their position, and we were forced to take drastic action. We had exhausted all avenues of recourse with the FAA, with no satisfaction. We then approached Overseas National Airways' management.

On April 17, 1973, Captain J. J. O'Donnell, President of the Air Line Pilots Association and Kelly Rueck, Vice President of the S & S Division of the Air Line Pilots Association, informed ONA management that the flight attendants and pilots would not enter the lower galley compartment until such time as an emergency escape hatch was installed in the DC-10-CF.

On April 23, 1973, ONA management informed ALPA and the ALPA S & S Division that an emergency escape hatch would be installed in the DC-10-CF and that such installation had been approved by the FAA.

Ms. ROBERTSON. This was no insignificant victory for our members. It was a very hard fought battle and worth it. The sad postscript to an account like this is our dismay with the lack of openness and cooperation afforded us by the very agency that should be concerned with total aviation safety. The FAA had been provided with documented reports of the dangers related to the galley lifts which included inoperable and jammed lifts, improperly functioning service carts which caused mechanical malfunctions of the lifts, lack of an adequate communication system between the lower galley and the upper compartment, excessive number of personnel being permitted in the lower galley, and lack of structural integrity of the flight attendant jump seat in the lower compartment.

Was our effort worth it? Yes. Just weeks later, on an Overseas National flight from New York to Frankfurt, Germany, just before landing, two flight attendants were trapped in the lower galley because both lifts had jammed. The flight attendants escaped by way of the recently installed manual escape hatch and were then able to assume their safe positions for landing.

It could be said that we had the opportunity to provide input into the certification process of the DC–10–CF, inasmuch as we have indicated that we had four or five meetings with the FAA and others. However, we consider all of our efforts to have been after the fact because the DC–10–CF was designed and actually on the production line at Douglas without the manual escape hatch when the FAA certificated the aircraft for use in commercial transportation.

It is this very "after-the-fact" certification process that has killed and severely injured flight attendants and passengers. This is the reason AFA is supporting a change in the certification process.

The supplemental written material we have made available for the record will clearly illustrate that once a part, component, or compartment has been certificated by the FAA, it is next to impossible to have it removed or eliminated from the aircraft—not by an airworthiness directive, change in the rules, nor modification by the airlines. The FAA and the airlines contend that the equipment is safe because it has been certificated by the FAA and, therefore, cannot be changed.

As an example of this inflexible thinking, an F–27 jump seat was ordered removed by the FAA in 1972 when a flight attendant was seriously injured in a crash involving this type of aircraft. Since 1967, through letters and reports, the AFA had brought this hazard to the attention of the FAA. This seat had not even met the original certification requirements. The FAA and the airline contended the seat had been certificated by the FAA and was, therefore, safe.

After the 1972 crash, the FAA and the National Transportation Safety Board determined that the seat had, in fact, not met the requirements under which the aircraft was type certificated. Again, the AFA's attempts failed to have a similar seat removed from service on another F–27, even though we had provided the FAA and the carrier proof of the dangers inherent in that seat. A flight attendant was killed while occupying that jump seat a year after this first accident.

I relate these incidents as an example of the counterproductive nature of the current certification process; we are concerned with safety, not secrets, and come here not in an adversarial role, but in the

spirit of cooperation to promote the sharing of information for the benefit and safety of our flight attendants and the passengers we serve.

I thank you very much for the opportunity to be heard.

Mr. BURTON. Thank you, Ms. Robertson.

Do you know, offhand, what the costs were of installing the manual lifts in those planes? What was the difference in the price per plane? Do you know?

Ms. MOTT. We do not have information on that, Mr. Chairman.

Mr. BURTON. Have you found a different level of concern in the different FAA regional offices?

Are some regions more cooperative than others, or are they all the same?

Ms. MOTT. Basically, they are all the same. But I think we would say that there are different branches within the FAA that are more cooperative than others. For instance, as an example, in the western region of FAA, the Flight Standards Branch is very cooperative. The Airframe Branch is not. This is one of the basic problems that we had, particularly with the DC–10–CF and other matters that we have submitted for the record.

Mr. BURTON. Have you found certain companies more willing to listen than others?

Ms. MOTT. Yes. I would say that we have found Lockheed to be extremely cooperative. They have asked for input and advice.

Mr. BURTON. Prior to their doing things?

Ms. MOTT. Prior to their designing in some cases and then during the design stages. This is definitely not the case with Douglas.

As far as Boeing is concerned, for instance on the 767—we have documented evidence that we have attempted for quite some time to work with them on the 767. Hopefully, through this hearing, maybe we will be able to.

Mr. BURTON. We might be interested in that, just so that we can make it available to FAA for their consideration.

Normally, you are not into the process until it is all over and even if you are in it they don't listen to much of what you say unless somebody dies; is that correct?

Ms. MOTT. I would like for Ms. Shelton to expand on that after I make a statement.

I would like to make it very clear that the jumbo aircraft did enter into service without regulations regarding the lower galley. I still feel it is dangerous, in that they don't have any regulations.

However, the jumbo aircraft did have an escape hatch from this lower compartment. It was something that we were not completely satisfied with but at least we were able to get out from underneath there.

This did not, in fact, make it a regulation that there will be an escape hatch in all jumbo aircraft. To this day, an aircraft could be built without an escape hatch.

The danger involved here was that we did have a certain level of safety. Then when the CF was designed and built, it came out with a lower level of safety which, again, was certificated by the FAA.

Our problem in not being involved with the certification process is that once something is in an airplane and the component or part is

certified by FAA, there is virtually no way to get it out. The FAA's key words concerning the lifts or escape from the aircraft are: "These lifts are certified only as a part of the aircraft and they must meet the load requirements of the structure requirements of the aircraft."

Mr. Chairman——

Mr. BURTON. Certified as part of the airplane?

Ms. MOTT. They can certify it as part of the airplane, but there is no regulation that necessarily governs that part or component.

Mr. BURTON. So they do not certify the part itself, but they certify the fact that it is in an airplane?

Ms. MOTT. That is exactly what it is. There is a jump seat in that lower compartment that does not meet the specifications of the regulations. FAA claims that the area is only occupiable during flight.

Therefore, everything in there is certificated as a part of the aircraft. There could be a flagpole in there, but it would be certificated as a part of the aircraft.

Mr. BURTON. Wouldn't that be a pole with a pulley and strings so that it would work?

Ms. MOTT. Not necessarily, no.

But you see, this is where our problem comes in. If we had the input into the process prior to that, then these are some of the things that we have the expertise and the knowledge about because we know where some of this equipment would best be placed. We know, for instance, what type of seats should be in the aircraft, such as head padding and shoulder harnesses, et cetera. But we do not have the ability to provide this input. We are not given this opportunity.

I would like to ask now if Ms. Shelton could explain how we get into the design stages, or if we do.

Mr. BURTON. Please proceed.

Ms. SHELTON. Normally speaking, we do not get involved in design. We have certainly tried.

I need to make the comment that by no means are we engineers, electrical engineers, or anything like that, but we are users of airplanes.

From that standpoint we feel that we are expert at knowing what our needs are.

So, when an aircraft manufacturer has a basic design in mind for that aircraft, our goal has been to then see that basic design and offer our criticisms or comments as to whether that basic design is adequate or inadequate for our needs.

As I say, we do not have much input in that area at all. It is probably one of our most critical areas.

Let me speak to this jump seat. The jump seat in the lower galley is what I am talking about. It is not certificated for the loads that a seat—it does not meet the requirements that a seat on the main desk would have to meet for takeoff and landing. It does not because it is only supposed to be occupied in flight.

We saw that seat long after the aircraft was in production. However, I did comment on the fact that I strongly felt it should be certificated for takeoff and landing loads, simply because a flight attendant is going to be stuck down there for either takeoff or landing.

You can provide the rules that say, "This will not happen," but that does not mean it does not happen.

In point of fact, we have many, many documents in our files which allude to the fact that flight attendants have indeed been stuck down there for one reason or the other, for particularly landing. This is the only seat they have and yet it will not withstand any crash impact loads for landing.

The answer given to my criticism, if you will, was that the seat would not be used for landing. Therefore, it was not necessary to upgrade it.

I would like to add one more comment, Mr. Chairman.

I am talking about cooperation with the FAA.

I would certainly say that working in the field we do get a very large amount of cooperation from FAA flight standards, particularly in the western region and the northwest region.

One thing I think might be interesting for the committee to know is that it is the engineering and airframe branch which finally certificates the aircraft. FAA flight standards does have input into the certification process.

However, if there is a conflict of interest in the certification process between the FAA flight standards and the airframe division, it is the airframe division's final selection or determination which determines the outcome of something that is designed and produced.

Mr. BURTON. Ladies, I want to thank you very much for your testimony.

We hope to ask some questions of Mr. Bond based on the statements that you have made and the cases that you have outlined.

The subcommittee will be in recess until 2:30 p.m.

[Ms. Robertson's prepared statement with attachments follows:]

PREPARED STATEMENT OF PATRICIA D. ROBERTSON, PRESIDENT, ASSOCIATION OF FLIGHT ATTENDANTS

Mr. Chairman, I am Patricia Robertson, President of the Association of Flight Attendants (AFA), which represents 18,000 professional flight attendants.

I am grateful for this opportunity to present our views to this Committee. I must also commend the Committee for taking up the issue of aircraft certification and for realizing that it is not simply a matter of procedural efficiency that we are talking about today, but, more important, a matter of safety and concern for human life.

The following account is but one example that directly involves the safety of passengers and flight attendants aboard commercial aircraft. It illustrates the vital necessity for user input and participation in the aircraft certification process. Other examples are being submitted for the record; but, for the sake of brevity, we wish to depict one specific example to illustrate, that, if there had been greater cooperation and openness on the part of the FAA in the cited case, a great deal of time and energy could have been saved and a safer aircraft could have been delivered directly from the production line.

This account deals with the certification of a jumbo aircraft, the DC-10 Convertible Freighter (DC-10-CF). As a point of explanation, all jumbo aircraft -- which include regular DC-10's, 747's, and L-1011's -- were introduced into service without any regulations governing the lower galley compartments below the passenger cabin. There were no regulations governing the elevator systems -- known as lifts -- which transport personnel from one level to the other and no regulations for emergency escape systems from the lower compartment. However, one feature which was designed

into the lower galley compartment of jumbo aircraft and certificated by the FAA was an emergency escape hatch. This emergency escape route leads from the lower galley compartment to a manual hatch, which, when opened by personnel in the lower compartment, affords escape into the aisle areas of the aircraft. This feature was designed into these jumbo aircraft in case of a mechanical or electrical failure of the personnel lift or the food cart lift; or in the event of an electrical shutdown. Additionally, it was also designed to permit access from the passenger compartment to the lower compartment, particularly for emergency situations. The electrically powered lifts, however, could not be considered as escape areas -- even with backup electrical systems -- due to the fact that, in the event of electrical failure, mechanical failure or engine shutdown, the lifts would not operate. Therefore, the manual escape hatch from the lower galley was designed.

In contrast to the other jumbo aircraft, prior to certification and delivery, the DC-10-CF was designed and built without a manual emergency escape hatch. In order for flight attendants to escape from the lower galley, it was assumed that the backup electrical system would suffice. No one gave thought to a malfunction of the backup electrical system or a mechanical failure or that both lifts might be up at the passenger level and not down in the galley. I am giving you this information after the fact -- because, if it had not been for rumors, the persistent efforts of our own safety representatives and our follow up on these suspicions, we could not have known the facts, and, consequently, the DC-10-CF would have gone into operation without a manual escape hatch.

In December of 1972, before the DC-10-CF had been certificated by the FAA, Mya Shelton, AFA Aircraft Technical Committee Chairperson, heard, by way of the grapevine, second or third hand, that a DC-10-CF would be built with no manual backup means

of escape from the lower galley to the passenger compartment. This emergency escape hatch was currently in use on all other jumbo type aircraft with lower galleys. Certainly, the FAA would not allow such an unsafe measure. Ms. Shelton decided to check it out.

On January 9, 1973, Ms. Shelton wrote to Mr. Wayne Garrison of the Air Carrier Branch of the FAA in the Western Region, questioning the validity of what she had heard relative to the DC-10-CF. About the same time, our National Office called the FAA Airframe Branch in Washington, D.C., to determine if such an aircraft was, indeed, being built.

The Washington FAA responded by saying that they were NOT AWARE of such an aircraft.

On February 1, 1973, Mr. Garrison answered Ms. Shelton's letter, stating, and I quote from his letter, "There have been many discussions with the McDonnell Douglas Corporation (builders of the aircraft) regarding the lower galley emergency escape hatch. However, to date, no formal presentation has been made. You can be assured that an equivalent level of safety will be provided and required prior to approval being given to any design."

Thirteen days later we learned from our Overseas National Airways' (ONA) flight attendant representatives that ONA was to receive delivery of the DC-10-CF in the latter part of April, and that this aircraft would not have an emergency escape hatch. On February 15, 1973, our office wrote to Mr. Nelson Shapter, then Chief of the Airframe Branch of the FAA, again asking for information concerning the DC-10-CF and questioning the lack of an escape hatch. In the interim, ONA was training their

flight attendants on the DC-10-CF and advising that if, and I quote, "trapped in the galley with both lifts inoperative, remain in the galley until the aircraft stops, at which time 'someone' would have to get you out through the cargo door." This door is located in a separate compartment aft of the lower galley compartment.

Our Association was not content with settling for such minimal levels of safety. We had sufficient evidence concerning lift malfunctions that we did not trust the lifts as an adequate escape route, and the training by ONA confirmed our fears. Our concern, Mr. Chairman, compelled us to exert every pressure to prevent the introduction into the air transport system of a jumbo aircraft not equipped with an emergency escape hatch so vital to any occupants of sealed compartments below the passenger compartment.

The meetings and letters generated by our Association proved to be fruitless. We discovered that, on April 17, 1973, the FAA had certificated the DC-10-CF without a lower manual emergency escape hatch. We previously notified the FAA that, while our flight attendants and pilots would fly aboard the aircraft, they would not enter the lower galley compartment until such time as the manual emergency escape hatch was built. Then, on April 17, 1973, ALPA and AFA notified ONA of the same information. Six days later, ONA informed us that a manual escape hatch would be built into the DC-10-CF.

Mr. Chairman, at this point, I am going to request that we be permitted to submit, for the record, our chronology of the meetings, letters, and telephone conversations concerning this matter between March 9, 1973 and April 23, 1973. These transactions are pertinent to the record.

36-953 O - 79 - 11

This was no easy or insignificant victory for our members; it was hard fought and worth it. The sad postscript to this account is our dismay with the lack of openness and cooperation afforded us by the very agency that should be concerned with total aviation safety. The FAA had been provided with documented reports of the dangers related to the galley lifts, which included inoperable and jammed lifts, improperly functioning service carts which caused mechanical malfunctions of the lifts, lack of an adequate communication system between the lower galley and the upper compartment, excessive number of personnel permitted in the lower galley, and lack of structural integrity of the flight attendant jump seat in the lower compartment.

Was our effort worth it? Yes! Just weeks later, on an Overseas National flight from New York to Frankfurt, Germany, just before landing, two flight attendants were trapped in the lower galley, because both lifts had jammed. The flight attendants escaped by way of the recently installed manual escape hatch and were able to then assume safe positions for landing.

It could be said that we had the opportunity to provide input into the certification process of the DC-10-CF, in as much as we have indicated that we had 4 or 5 meetings with the FAA and with Douglas Aircraft. However, we consider all of our efforts to have been after the fact, because the DC-10-CF was designed and actually on the production line at Douglas WITHOUT THE MANUAL ESCAPE HATCH when the FAA certificated the aircraft for use in commercial transportation.

It is this very "after the fact" certification process that has killed and severely injured flight attendants and passengers. This is the reason AFA is supporting a change in the certification process.

The supplemental written material that we have made available for the record will clearly illustrate that once a part, component, or compartment, has been certificated by the FAA, it is next to impossible to have it removed or eliminated from the aircraft -- not by an Airworthiness Directice, change in the Rules, nor modification by the airlines. The FAA and the airlines contend that the equipment is safe because it has been certificated by the FAA and, therefore, cannot be changed.

As an example of this inflexible thinking, an F-27 jump seat was ordered removed by the FAA in 1972 when a flight attendant was seriously injured in a crash. Since 1967, through letters and reports, the AFA had brought this hazard to the attention of the FAA. This seat had not even met the original certification requirements! The FAA and the airline contended the seat had been certificated by the FAA and was, therefore, safe. After the 1972 crash, the FAA and the National Transportation Safety Board determined that the seat had, in fact, not met the requirements under which the aircraft was type-certificated. Again, the AFA's attempts failed to have a similar seat removed from service on another F-27, even though we had provided the FAA and the carrier proof of the dangers inherent in that seat. A flight attendant was killed while occupying the jump seat a year after the first accident.

I relate these incidents as an example of the counter-productive nature of the current certification process; we are concerned with safety, not secrets, and come here not in an adversarial role, but in the spirit of cooperation to promote the sharing of information for the benefit and safety of our flight attendants and the passengers we serve.

Thank you, Mr. Chairman, for this opportunity to be heard.

CHRONOLOGY OF AFA ACTIVITIES CONCERNING DC-10-CF

SUBMITTED FOR THE RECORD

ACTIVITIES BETWEEN MARCH 9, 1973 and APRIL 23, 1973

On March 9 and 20, 1973, Ms. Shelton and Mrs. Mott met with the FAA Western Region concerning this matter and continued to request that a manual escape hatch be installed in the DC-10-CF.

On March 12, 1973, we requested a meeting with Douglas Aircraft to attempt to resolve the matter with them prior to certification and delivery. Additionally, the ONA AFA representatives, by letter, contacted their respective officials, including the pilot representatives, in an effort to emphasize the importance of the emergency escape hatch as an alternate escape route from the lower galley compartment.

During the latter part of March, 1973, Mr. Shapter of the FAA Engineering Branch in Washington, wrote to our National Headquarters assuming that our meetings with the FAA Western Region "had satisfied our needs." On April 10, 1973, our National Office wrote Mr. Shapter informing him and the FAA Western Region that, in fact, the meetings with FAA had not been satisfactory under any conditions. On April 10, 1973, a telegram was sent to FAA Western Region requesting full information concerning the possible certification of the DC-10-CF, names of certificating officials, and questioning whether it had, in fact, been certificated without a manual escape hatch.

On April 13, 1973, Ms. Shelton and the AFA ONA representative met with the FAA and Douglas Aircraft concerning the lack of manual escape system from the lower galley compartment of the DC-10-CF.

On April 13, 1973, the President of the Air Line Pilots Association, with the support and backing of the Overseas National pilot and flight attendant safety representatives and the AFA National Office, wrote to Mr. Butterfield, Administrator of the FAA, stating that, if the FAA were to certificate the DC-10-CF without an emergency escape hatch from the lower galley compartment to the main deck of the aircraft, the pilots and flight attendants would not enter into the lower galley until such time as a manual escape hatch was installed.

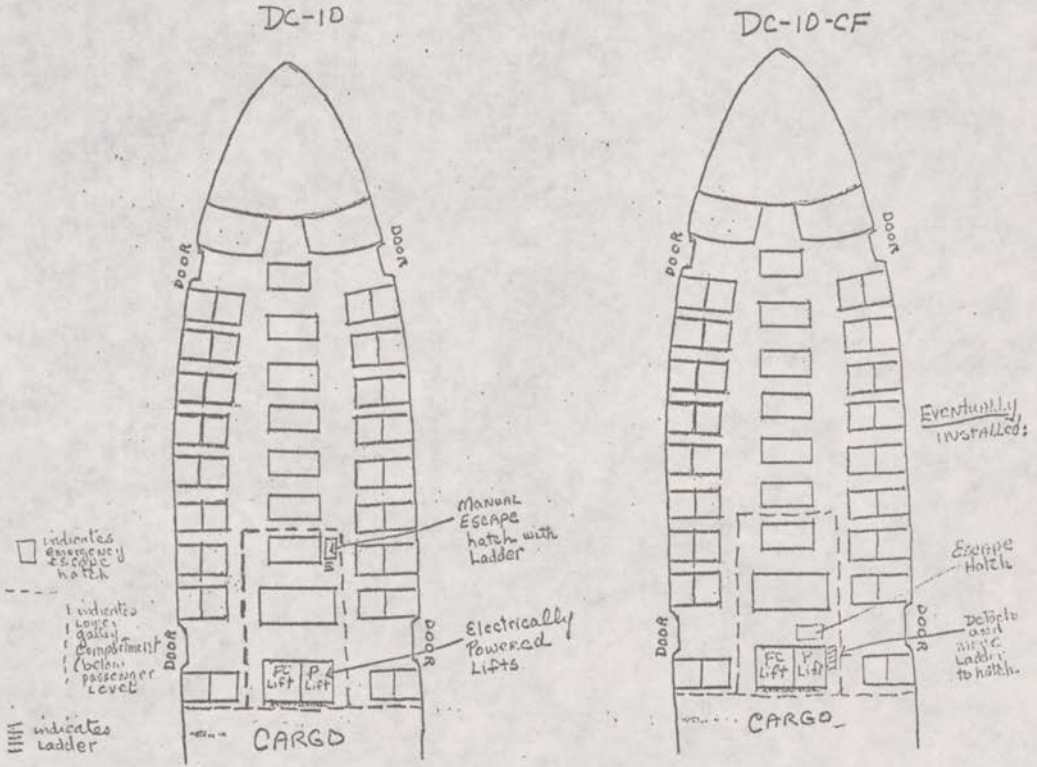
On April 17, 1973, FAA Western Region certificated the DC-10-CF without an emergency escape hatch from the lower galley compartment. AFA and ALPA were notified of such by letter dated May 9, 1973 from Mr. James Rudolph, then Director of Flight Standards.

FAA did not alter their position, and we were forced to take drastic action. We had exhausted all avenues of recourse with the FAA, with no satisfaction. We then approached Overseas National Airways' management.

On April 17, 1973, Captain J. J. O'Donnell, President of the Air Line Pilots Association and Kelly Rueck, Vice President of the S & S Division of the Air Line Pilots Association, informed ONA management that the flight attendants and pilots would not enter the lower galley compartment until such time as an emergency escape hatch was installed in the DC-10-CF.

On April 23, 1973, ONA management informed ALPA and the ALPA S & S Division that an emergency escape hatch would be installed in the DC-10-CF and that such installation had been approved by the FAA.

Diagram


DC-10
DOOR
DOOR
DOOR
DOOR
MANUAL ESCAPE hatch with ladder
Electrically Powered Lifts
FC Lift
P Lift
CARGO
indicates emergency escape hatch
indicates lower galley compartment (bottom passenger level
indicates ladder
DC-10-CF
DOOR
DOOR
DOOR
DOOR
Eventually installed:
Escape Hatch
Debris and misc. ladder to hatch
FC Lift
P Lift
CARGO

AFA ATC Ltr

ASSOCIATION OF FLIGHT ATTENDANTS-
1625 MASSACHUSETTS AVENUE, N.W., WASHINGTON, D.C. 20036, 202-797-4015

September 22, 1978

The Honorable John L. Burton
Chairman
Government Activities and Transportation Subcommittee
Rayburn House Office Building
Room B-350-A-B
Washington, DC 20515

Dear Congressman Burton:

Much of the work I do, as Chairperson of the Aircraft Technical Committee, concerns itself with aircraft and aircraft component design and evaluation. Ideally, I start with an aircraft in its design stages, follow it through the changes made during production, its in-service life via communication with the flight attendant safety representatives on the airlines that utilize the particular aircraft, my participation at the Federal Aviation Administration (FAA) Minimum Equipment List (MEL) meetings, and if need be, I then follow the aircraft through its "injury" and/or "demise" -- an incident or accident.

Briefly, the MEL meeting is held for purposes of changing the operating rules for the aircraft. Participants include, on a formal basis, representatives from the FAA, the aircraft manufacturer, and the airline operating the particular aircraft. On an informal basis, participants also include representatives from the Association of Flight Attendants and the Air Line Pilots Association. The FAA currently has no vehicle for formal participation of flight attendants and pilots. They have stated that they see no reason for creating a method by which our organizations, representing the people who use the aircraft, can propose changes in the operating rules.

I stated at the onset that, ideally, this is what I do. Practically speaking, I do not have much access to the aircraft during its design phase -- which is probably the most critical phase -- as it involves the certification process.

I noted with chagrin FAA Administrator Boyd's statement in his interview with Aviation Daily, published August 23, 1978. He states, "Interested groups are always invited to participate in the certification process." I have worked on my own and with pilot representatives evaluating aircraft, and, during those periods we have never been invited to participate in the certification process. When we asked to be included, we have been denied participation.

The Administrator goes on to state in the interview, "I am bemused with the notion that we in FAA are not an independent party." I must ask -- When a party concerns itself with economic impact, how can it remain independent?

I further do not understand why the FAA feels it is an independent party, when, as the Committee is aware, it appoints Designated Engineering Representatives (DER's), employees of the manufacturer, to act on its behalf in the certification process.

I would now like to cite a few cases involving the certification process.

First case - the F-27 flight attendant jump seat. It seriously injured one flight attendant. Its use was objected to by our Association, which was told by the FAA that it was certificated as safe, and shortly thereafter killed another flight attendant.

Another case is the side-facing jump seats that were certificated as safe, and, yet, with a flight attendant seated on them they fell off the wall. To the FAA's credit, they finally ordered, with the exception of one, the side-facing seats removed from the aircraft involved. The one exception is the fold down sideways-forward facing jump seat which is still certificated as safe. The FAA stated that it would not certificate any more side-facing jump seats, and, yet, we see this fold down sideways-forward facing seat on the A-300, which has been certificated under the equivalent level of safety regulation which is used for foreign built aircraft operating in the United States. I can, with certainty, tell you that no flight attendant was ever involved in these cases of certification.

Let me take one more case to illustrate the certification process. I will provide a little background. Flight attendant jump seats fold up when they are not in use. This is because the FAA has a regulation which states that there must be at least a 20 inch access, free and unobstructed, to the exits. That is, 20 inches unobstructed in the area leading to the main aisles, in the main aisles leading to the exits, and in the exit area itself. In order to meet this criteria on most aircraft, the jump seat must fold up, and it must fold up automatically; that is, not be pushed up into the retracted position by any individual. At a post-crash hearing, which was held by the National Transportation Safety Board (NTSB), the FAA was asked how the jump seat could possibly meet the 20 inch access requirement if a flight attendant was still seated on it, injured, incapacitated, or dead. The FAA answered, "The obstruction would have to be removed." Mr. Burton, can you possibly imagine that any knowledgeable flight attendant would not object to this type of reasoning for certification?

NTSB research will tell you that, statistically speaking, flight attendants sustain the highest percentage of injury or death in aircraft accidents of any group on board the aircraft. Most accidents happen either during takeoff or landing, which means that the flight attendants are seated. The NTSB research has been pointed out to the FAA many times.

I note that, in the August 23, 1978 interview with Aviation Daily, Administrator Bond concerns himself with "protecting proprietary information and promoting the manufacturers at home and abroad." I, too, share his concern with promoting the manufacturers at home. However, any of us directly involved in the United States aviation industry would be an unlikely candidate for industrial espionage.

Remember, the people in the Association of Flight Attendants and the Air Line Pilots Association involved in aircraft evaluation are experts at what we do. Furthermore, we are, in the main, line flight attendants and pilots, so that we are not only experts in special areas, but are experts in general, as daily users of the aircraft. As people directly involved with the daily use of these aircraft, we know that our livelihoods depend on the ability of the aircraft manufacturer to produce airplanes. However, we also know that our lives, and the lives of our passengers depend on the safety of those airplanes.

Safety has to also depend on the users' direct participation in the certification process. If the FAA wishes to exclude those groups which are not directly involved in the aviation industry, that is their business, but, in an effort to accomplish this, the FAA must not also exclude those groups which are directly involved on a day-to-day user basis. Doing so obviously makes the certification process one-sided, and, in many cases, unsafe.

Sincerely,

Mya Shelton

Mya C. Shelton, Chairperson
Aircraft Technical Committee
Association of Flight Attendants

NCS:gw

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WESTERN REGION
P.O. BOX 92007, WORLDWAY POSTAL CENTER
LOS ANGELES, CALIFORNIA 90009

DC-10-CF

1 February 1973

Miss Mya C. Shelton
Chairman, ALPA S/S Division
New Aircraft Evaluation Committee
325 Ridgeview Drive #129
Kent, Washington 98031

Dear Miss Shelton:

This is in response to your letter dated 9 January 1973 concerning the DC-10 Convertible Freighter and PSA L-1011 aircraft.

We offer the following comments on the items you discuss:

DC-10 Convertible Freighter
There have been many discussions with the McDonnell Douglas Corporation regarding the lower galley emergency escape hatch. However, to date, no formal presentation has been made.

You can be assured that an equivalent level of safety will be provided and required prior to approval being given to any design.

PSA L-1011
To date, only exploratory discussions have been held with Lockheed regarding the lower lobe passenger compartments. Therefore, it is premature at this time to respond to your comments until firm proposals have been received and evaluated.

The areas of concern expressed by you are ones that must be evaluated and resolved before any approval can be issued. However, the ALPA/SSD may be assured that all crashworthiness requirements will be equally applicable to lower lobe passenger compartments and, if necessary, special conditions will be developed.

We appreciate your concern and suggestions relevant to these two aircraft.

If we can be of further assistance in safety matters, please advise.

Sincerely,

Wm. E. Garrison

W. E. GARRISON
Air Carrier Operations Specialist
Air Carrier Branch

February 15, 1973

Mr. Nelson Shapter
Chief, Airframe Branch
Federal Aviation Administration
800 Independence Ave., S. W.
Washington, D. C. 20591

Dear Mr. Shapter,

Enclosed is a copy of a letter to Mr. Garrison from Mya Shelton concerning 2 subjects which I feel need your attention and comments.

Miss Shelton has expressed valid concern about the escape of anyone occupying the lower galley of the DC10 convertible freighter and I think it is important that her comments be taken into serious consideration.

We have been informed that Overseas National has purchased three of these convertible freighters for delivery in March. The ALPA representatives for Overseas National have called to express their concern about emergency escape from the lower galley area if the lifts should become inoperative in the up position. We have been told that there is a requirement that each of the two galley lifts will have to have 2 motors to provide for a back up system for escape, however this will not alleviate the danger of both galley lifts inoperative in the up position.

Mya's statement of concern regarding the possibility of passengers occupying the lower compartment also has valid comments and questions for which we would like to have answers.

We would appreciate hearing from you as soon as possible relative to the Convertible DC10 freighter and occupancy of its lower galley, so that we may provide answers to our representatives.

Very truly yours,

Del R. Mott

DRM/kb
Enclosure
cc: Mya Shelton
Pam Green

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

26 MAR 1973

RECEIVED
MAR 28 1973
S & S AIR SAF...

Mrs. Del R. Mott
Air Line Pilots Association
Steward & Stewardess Division
1625 Massachusetts Avenue, N.W.
Washington, D. C. 20036

Dear Mrs. Mott:

This is in response to your letter dated 15 February 1973 concerning the convertible freighter DC-10 and the PSA L-1011 airplanes.

Safety aspects relating to the use of lower compartments on the referenced DC-10 and L-1011 airplanes were informally discussed with you and our Western Region Office personnel on 9 March 1973. It is presumed that such discussions satisfied your needs.

If you have additional questions subsequent to your visit with the Western Region Office on 20 March 1973, we will be happy to discuss them with you.

Sincerely,

for R. Allen
N. SHAPTER
Chief, Airframe Branch
Engineering and Manufacturing Division
Flight Standards Service

AIR LINE PILOTS ASSOCIATION
STEWARD & STEWARDESS DIVISION
1625 MASSACHUSETTS AVENUE, N.W. □ WASHINGTON, D.C. 20036 □ [202] 347-2211

April 10, 1973

Mr. Nelson Shapter
Chief, Airframe Branch
Engineering and Manufacturing Division
Flight Standards Service
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

Dear Mr. Shapter:

Your letter of March 26, 1973 presumed that my discussions with you and the Western Region FAA has satisified my needs as to the safety aspects of using the lower galley on the DC-10 convertible freighter. I must reiterate that I was not satisified with these discussions, nor was I satisfied with the answers to the many questions asked by Miss Shelton and me.

We are interested in providing a manual means of escape from the lower galley of this aircraft, no matter how redundant the electrical system may be. Apparently, mechanical malfunctions and electrical failures were not taken into serious consideration at the time of certification of this aircraft configuration. We are continuing our efforts to correct this intolerable situation and will continue to do so until some method of manual escape is provided for the occupant of the lower galley.

Very truly yours,

Del R. Mott
Air Safety Coordinator

cc: Captain J. J. O'Donnell, President
Kelly Rueck, Vice President
Mya Shelton, New Aircraft Committee, Chairman
Pam Greene, 39-S Safety Chairman, ONA
Roberta Weddle, ONA Master Executive Chairman
Wendy Wilbur, ONA Central Safety Chairman
Captain M. F. Marshall, ONA Pilot Master Executive Chairman
Captain T. Secola, ONA Pilot Central Safety Chairman
Mr. R. S. Sliff, FAA

TELEGRAM/TELEX

SENT APRIL 10, 1973

Mr. Richard Sliff, Chief
Aircraft Engineering Division
Department of Transportation
Federal Aviation Administration, WE-100
15000 Aviation Boulevard
Hawthorn, California 90360

Reference: Douglas DC-10 Convertible Freighter

Dear Mr. Sliff:

Would appreciate your providing me with following information via return telex:

1. Has the above aircraft been certificated to operate with full passenger load, to be converted to full cargo carriage at desired time? If so, which airlines?

2. Has this aircraft been certificated to operate with mixed (passenger, cargo) configuration? If so, which airlines?

3. Has the lower galley area been certificated without the manual escape hatch provided in other wide bodied aircraft?

4. Would you please provide the dates of certification for (1),(2), and (3)?

5. Would you please provide the names of certificating officials for (1), (2), and (3)?

I appreciate your cooperation.

Very truly yours,

J. J. O'Donnell

AIR LINE PILOTS ASSOCIATION
1625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 797-4000

April 13, 1973

Mr. Alexander P. Butterfield, Administrator
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D. C. 20590

Dear Mr. Butterfield:

A matter of great urgency has been brought to my attention which I feel compelled to advise you of immediately. We are informed that the Aircraft Engineering Division of the FAA anticipates certifying the DC-10-30 Convertible Freighter for passenger use on Tuesday, April 17, 1973. However, in the opinion of ALPA, a serious omission has been made in the present configuration of the lower galley on that aircraft.

Unlike other wide-bodied airplanes, including all other models of the DC-10, the Convertible Freighter has no manual escape hatch from the lower galley making access into, or escape from, that galley impossible in an emergency if the elevators, which need both adequate electrical power and unimpeded passageways, fail to function.

The Air Line Pilots Association, therefore, must categorically state that certification of the aircraft for passenger use without a separate manual means of escape or assistance to the lower galley would be unsafe. Please be advised that the Association will strongly urge its pilots and flight attendants not to enter into the lower galley any time in the proposed configuration. Moreover, we must point out that the Association has been advised, by reliable sources, that the manufacturer of the aircraft, McDonnell-Douglas, has the capability to correct the situation and install a manual hatch in a matter of days.

In conclusion, the Air Line Pilots Association respectfully, in the interests of safety, urges you to exercise your authority and not allow this departure from former certifications of wide-bodied aircraft.

Sincerely,

J. J. O'Donnell

J. J. O'Donnell, President

JJO'D:pr
cc: Governor Reed, NTSB
R. S. Sliff, FAA
Executive Committee, ALPA
ONA MEC

Mr Brennan
ONA
S+S
Flt

AIR LINE PILOTS ASSOCIATION
1625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 797-4000
ARTHUR A. BRENNAN

AGS 18 1973
...ration

April 17, 1973

Mr. J. W. Bailey, President
Overseas National Airways, Inc.
147-39 175th Street
Jamaica, New York 11430

Dear Mr. Bailey:

It has come to ALPA's attention that a serious safety problem exists relating to the DC-10-30 convertible freighter which ONA is taking delivery of today. To the best of our knowledge, the aircraft does not, in its present configuration, possess a lower galley manual escape hatch. Without the hatch, access into or escape from the galley in an emergency is impossible if the elevators, which need both adequate electrical power and unimpeded passageways, fail to function. Under the circumstances, the Association is compelled, solely for reasons of safety, to urge its members, both pilot and flight attendants, not to enter the lower galley on the aircraft at any time until adequate measures are taken to insure their welfare.

ALPA has also been informed that McDonnell-Douglas possesses the capability to install a manual hatch in a matter of days. Moreover, we understand ONA does not plan passenger utilization of the aircraft this month. We, therefore, respectfully request you to take whatever actions are necessary to install a lower galley manual escape hatch in your DC-10 convertible freighter, thereby eliminating a serious compromise with safety which ALPA cannot condone.

Sincerely,

J. J. O'Donnell, President

Kelly Rueck, Vice President
Steward and Stewardess Division

cc: ONA MEC - Pilot and S&S

J. W. Bailey, President

OVERSEAS NATIONAL AIRWAYS

RECEIVED
APR 24 1973
PRESIDENT'S DEPT.

April 23, 1973

Mr. J.J. O'Donnell
President
Air Line Pilots Association
1625 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Dear Mr. O'Donnell:

I have your letter, dated April 17, 1973, signed by you and Ms. Kelly Rueck concerning the matter of a lower galley manual escape hatch on our DC-10-30 convertible aircraft.

Attached is a copy of the bulletin that has been disseminated to our flight attendants which clearly indicates the Company's position on this matter. As you can see from the contents of the bulletin, ONA has been pursuing this matter for some time. Even though the FAA has certificated the standard galley installation, through the combined efforts of Douglas and ONA, an additional alternate escape route was developed which we now believe, when incorporated, will offer an even greater degree of safety to our operating personnel.

I assure you this Company has great concern for the safety of its people and we will continue to take whatever steps we deem appropriate to protect the welfare of all our employees.

Sincerely,

Attachment

cc: Mr. Anthony G. Viglass
Mr. Malcolm E. Starkloff

36-953 O - 79 - 12

OVERSEAS NATIONAL AIRWAYS

April 19, 1973 Flight Attendant Bulletin #FS/12/73

TO: All Flight Attendants

FROM: Vice President, Passenger Service

SUBJECT: DC-10 LOWER GALLEY ESCAPE HATCH

For several months now, the Engineering Department of ONA has been reviewing the matter of emergency egress from the lower galley area of our DC-10 aircraft. As those of you who have received DC-10 training are aware, the lower deck galley area is serviced by two elevators each of which is operated by a primary electrical motor and a backup motor with a crossover network which means that all four motors must fail before the elevators are completely inoperative. In addition, there is an escape hatch through the top of the service elevator which of course must be in the "down" position to be usable.

In addition to the two elevators, all straight passenger DC-10's with lower deck galleys have a manual escape hatch cut through the cabin floor near the galley area. Such a provision was not incorporated in the convertible model of the DC-10 because of the necessity of a much stronger cabin floor and a requirement for floor tracks to sustain cargo loading systems.

The New York Chairman of your Stewardess Safety Committee, Pamela Greene, has discussed this matter with me on several occasions and has expressed her concern about the safety of personnel occupying the galley area. Although the Company with Douglas Aircraft engineers has explored a number of possibilities that would provide a manual escape route, we have been unable to make a definitive evaluation of the safety factors until such time as the FAA completed the certification of the aircraft. This certification was completed on April 17 and the FAA has certificated the aircraft for operation of the lower deck galleys without a manual escape hatch. However, the FAA has imposed certain operating restrictions regarding the use of the elevators and in response to these restrictions, and our prior discussions with Douglas and concern over this matter, Douglas Aircraft has developed Service Bulletin 52-69 which provides for a manually operated escape hatch to be cut in the cargo floor near the galley area. When this Service Bulletin has been incorporated in the aircraft, the operational restrictions imposed by the FAA can be eliminated.

On April 17 ONA instructed Douglas to perform the Service Bulletin and the emergency escape hatch will be completed on our first DC-10 by April 26, 1973. The Bulletin will be incorporated on the second ONA DC-10 aircraft scheduled for delivery about July 1, 1973.

My purpose in sending you this bulletin is to reassure you that ONA is just as concerned with the safety of our crew members as we are with our passengers and we constantly review our procedures and technological developments within the

aircraft industry to ensure that our equipment is being properly operated, maintained and equipped. Last week the Company sent Miss Greene to the Douglas plant in Long Beach where the Douglas engineers gave her a full briefing and inspection of the galley area, including the operation of the elevators and other equipment.

You can be assured that ONA will continue, as it has in the past, to carefully consider the safety factors of our operation and we will take any appropriate action to correct situations that even border on the area of compromise.

A. G. Viglass

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

May 9, 1973

RECEIVED
MAY 14 1973
PRESIDENT'S DEPT.

Mr. J. J. O'Donnell
Air Line Pilots Association
1625 Massachusetts Ave. N.W.
Washington, D.C. 20036

Dear Mr. O'Donnell:

This is in response to your letter dated April 13, 1973, concerning FAA certification of the DC-10-30 Convertible Freighter Airplane.

The passenger configured DC-10-30 Convertible Freighter Airplane was certificated on April 18, 1973, by our Western Region Office on the basis of meeting all FAA requirements and is at least equivalent of previously certificated wide-bodied jets with under floor galley.

The criterion for certification of the Convertible Freighter DC-10 was the same as applied to other DC-10 and wide-bodied airplanes. The new dual galley lift system with independent power devices, and improved survival equipment, was shown to provide a way out of the galley under all probable failure modes.

In addition, occupancy of the galley is prohibited if one failure occurs in the lift system, as well as the normal prohibition against occupancy during taxi, takeoff and landing. These specific limitations are in the airplane flight manual.

We appreciate the flight attendants' concern. However, we have carefully evaluated system redundancy and have expanded limitations of galley use to assure that a satisfactory level of safety is maintained.

Sincerely,

James F. Rudolph

JAMES F. RUDOLPH
Director, Flight Standards Service

AIR LINE PILOTS ASSOCIATION
625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 347-2211

May 25, 1973

Mr. Alexander P. Butterfield
Administrator
Department of Transportation
Federal Aviation Administration
Washington, D. C. 20591

Dear Mr. Butterfield:

This is in response to a letter dated May 9, 1973, from Mr. James F. Rudolph, Director, Flight Standards Service, Federal Aviation Administration, that requires further comment on behalf of the Air Line Pilots Association.

The DC-10-30 Convertible Freighter is the only wide bodied airplane certificated to service without a manual escape hatch from the lower galley. The Air Line Pilots Association cannot equate, as the FAA appears willing to, the additional prohibition against occupancy of the galley after one failure occurs in the lift system with the safety afforded in all circumstances and at all times by the inclusion of a manual escape hatch.

It is fortunate, however, that the Association is not content with settling for minimum levels of safety. Our concern compelled us to exert every effort to prevent the introduction into the air transport system of wide bodied aircraft not equipped with a manual escape hatch from the galley. The Association stated its position to the FAA's Western Region prior to the certification of the DC-10-30 Convertible Freighter. In addition, the Association protested to Overseas National Airways, the recipient of the first DC-10-30 Convertible Freighter. Attached you will find documented the actions subsequently taken which were consistent with its sense of responsibility to provide adequate safety for its flight attendants. The Association salutes that action.

In conclusion, the Air Line Pilots Association reasserts its intention to strongly urge its pilots and flight attendants not to enter the lower galley of a DC-10-30 unless it has a manual escape hatch and respectfully urges you, in the interest of safety, to exercise your authority and modify the present certification of the DC-10-30 Convertible Freighter.

Yours truly,

J. J. O'Donnell, President

JJO'D:ck
cc: Linnert, Bonner, Kelly, Rueck

AIR LINE PILOTS ASSOCIATION
STEWARD & STEWARDESS DIVISION
1625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 347-2211

521 p. 2

June 6, 1973

Mr. George S. Moore
Associate Administrator for Operations
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

Dear Mr. Moore:

Since the advent of wide-bodied aircrafts with lower lobe galleys, the ALPA S&S Division has documented the complaints of flight attendants who must occupy the lower lobe galleys as to their personal safety and the safety of the passengers for which they are responsible. These documented reports include such items as inoperable and jammed galley lifts, improperly functioning service carts, excessive service required by the airline with no storage for the extra equipment required to provide the service, lack of, poor, or no communication systems to and from lower galleys, the number of flight attendants allowed in the lower galley at one time and the facilities provided for them as well as passengers visiting the lower lobe during flight.

Reports as those mentioned above seriously point out the laxity of the Federal Aviation Administration in failing to include these lower galleys in any current rule, and even more seriously point out the imminent dangers to the passenger aboard the flight. These reports have been submitted continually to the Northwest and Western Regions, FAA by the S&S New Aircraft Evaluation Committee Chairman, Mya Shelton and by me to the Washington office of the FAA. No action has been taken.

Therefore, we request that your staff review these reports which have previously been submitted and we request that regulatory action be taken or policy decisions be made immediately. This must be done before a catastrophe occurs.

Specifically, regulations are needed in the following areas of lower lobe galley protection and safety -- each of these has been previously documented by the S&S Division of ALPA:

(1) The number of flight attendants in lower lobe galley areas at any one time:

(A) Most airlines have no specific policy and only one double occupant flight attendant jumpseat is available in the event of turbulence or other inflight incident.

(B) The double jumpseat mentioned in A has no requirement to be stressed for crashload conditions.

(C) With only one double flight attendant seat available, any additional flight attendants occupying the lower galley would be subjected to serious injury during adverse flight conditions thus rendering them incapable of performing their in-cabin duties for passengers.

(D) Although some airlines provide two drop down oxygen masks and two walk-around bottles, this does not alleviate the possibility of serious injury to those additional flight attendants in the lower galley.

Reference should be made to the recent NTSB report entitled "In-Flight Safety of Passengers and Flight Attendants Aboard Air Carrier Aircraft" dated March 14, 1973 which cites the necessity for constant flight attendant surveillance within the aircraft cabin to assure passenger safety.

(2) Certification of a wide-bodied aircraft which does not provide accepted safety features, i.e., DC-10 Convertible Freighter which was certificated by the FAA without a manual escape hatch from the lower galley.

(A) Escape from the lower galley of the above aircraft was predicated only on the position of the galley lifts at time of emergency and emergency operation of the lifts totally dependent of the "type" of emergency.

(B) Escape from the lower galley is impossible in the event of total electrical failure, mechanical malfunction or human error.

(C) Flight attendants were trained to accept the possibility that they could be trapped in this lower galley if lift power could not be restored in an emergency. They were told they would be rescued through the module loading door (cargo area) after the aircraft landed. No consideration was given to the necessity of the flight attendant's providing leadership for her passengers in the upper level -- to say nothing of the flight attendant's own safety should the airplane crash while she was trapped.

(D) No consideration was given to the possibility of the "galley girl" needing assistance from the upper level, or to the removal of an injured person from the lower galley.

(E) An escape hatch (manual) and ladder was installed in the Overseas National Aircraft of this configuration only because these flight attendants refused to fly on the aircraft until a manual escape hatch and ladder was installed. However, the manual escape hatch and

ladders of all other wide-bodied aircraft are directly related to each other. The escape ladder built into the Overseas National DC-10 is around the corner from the escape hatch itself and requires multiple steps to operate and cannot be considered as an example of safety to occupants or passengers for future escape on wide-bodied aircraft.

(F) All other wide-bodied aircraft (DC-10-10, DC-10-30, 747, L-1011) configured with lower lobe galleys were certificated with a manual escape hatch and ladder. A precedence to assure escape and assistance to passengers by the flight attendants was established on these wide-bodied aircrafts. The trade off for the lack of manual escape system of the DC-10 Convertible Freighter was obviously to cut cost, which in turn cut safety factors.

(G) No commercial building code that we are aware of allows escape from that building via only an elevator (lift).

(3) Communications with lower lobe galleys. There is no requirement for an operative communication system between cabin/cockpit and lower lobe. Because of the inability of upper deck occupants to communicate (inoperative interphone or warning system) with occupants of lower lobe areas the following exists:

(A) Flight attendants often find themselves riding in the lower lobe galleys for take off due to inoperative communication systems after taxi (reminder: flight attendant seats are not stressed for crashload conditions).

(B) Flight attendants often are not aware of forthcoming turbulence due to inoperative communication systems.

(C) Flight attendants have found the carts too heavy to roll around in these lower galleys during descent. Carts also frequently dislodge from their locked positions. A warning of descent cannot be transmitted due to inoperative communication systems.

(D) If necessary to request additional assistance due to lower lobe galley problems or injury, flight attendant is often unable to communicate with upper deck due to inoperative communication systems.

(E) Flight attendants have been in lifts attempting to ascend during take off or landing because of inoperative communication systems.

(4) Lower lobe flight attendant jumpseat (double seat accommodating two flight attendants).

(A) These seats are not required to be stressed for crashload conditions as they were not intended for use during take off and landing.

(B) No restriction has been placed on occupancy of lower lobe galleys during taxi, with the exception of the L-1011. Due to service workload, flight attendants must occupy these galleys prior to take off and often remain in this area for the take off and occasionally landings

(C) No windows or visual monitors are available in lower lobe galleys (exception L-1011) to allow the flight attendants a relation to their surroundings, i.e. immediate take off, sudden stops, or imminent landings.

(D) During flight, one jumpseat will accommodate only two flight attendants. There is no protection for additional flight attendants who may be in lower galleys during adverse condition

(E) On some wide-bodied aircraft, seats do not offer head protection and surrounding areas are not sufficiently padded.

(F) When two of the required number of flight attendants are in lower lobe galley, no training is provided for remaining flight attendants on the upper deck to cope in an emergency without a full cabin crew.

(5) No requirement concerning passengers visiting lower lobe galleys. Passengers visit lower lobe galleys, thus endangering their lives as well as those of the flight attendants in unexpected turbulenc or decompression.

(6) Smoke masks in lower lobe galleys.

(A) Some 747's on United have smoke masks for flight attendant use but United DC-10's have none. This is also true on other airlines.

(B) DC-10 Convertible Freighter has smoke masks in lower galley but other DC-10's do not have smoke masks. No requirement.

(7) The Master Minimum Equipment List though it included provisions for the number and type of inoperative galley lifts on the DC-10's and L-1011 now does not include the 747 galley lifts thus:

(A) The decision is now left up to the individual FAA Principal Operations Inspector.

(B) As per previous documentation illustrated, the individual interpretations by various POI's have been inconsistent and misinterpreted causing confusion by many carriers. Any use/operations interpretations (including baggage restrictions, food and beverage service, etc.) should be uniformly consistent throughout the industry.

(8) Master MEL on the DC-10 and L-1011 allows flight attendants or passengers to use either the cart or personnel lifts.

(A) The above allows that flights may be dispatched with one lift, either cart or personnel, inoperative. The amount and type of service is predicated on the time element and the use of both lifts. Yet service requirements with one lift inoperative remain the same as if both lifts are operative.

(B) If the personnel lift is inoperative, people are allowed to ascend and descend in the cart lift in spite of the dangers involved when personnel use the smaller cart lift.

(9) Cart lifts determined unsafe for personnel use. Some carriers have restricted the cart lifts for cart use only due to the dangers involved if used by personnel and following are some of the procedure which have been established in the event of an inoperative personnel lift.

(A) Flight attendants shall descend and ascend the galley by using the ladder provisions of the cart lift or,

(B) Flight attendants shall use the escape hatch and ladder to ascend and descend the galley.

(10) Training.

(A) Flight attendants during training are not required to climb up the cart ladder from the lower lobe galley. Nor do flight attendants practice assisting another flight attendant from the cart lift in the down position during their initial or recurrent training.

(B) Flight attendants during training are not required to operate or utilize the emergency latch and provisions of the personnel lift.

Training for both A and B above is instructed verbally.

(11) No restrictions or requirements for food and service carts themselves.

(A) Inadequate locking devices do not properly control movement of carts during flight.

(B) Since there is no regulation covering stowage of carts and since these carts are allowed to remain on the upper level (DC-10 at 4 left and 4 right), the restraining strap hooks and attachment points as well as the restraint straps must be stressed to withstand crashload conditions.

(C) There are no restrictions for the gross weight of the carts.

Other facets of safe operation pertaining to wide-bodied aircraft have also been neglected in the regulatory process.

A point of fact is that all aircraft, regardless of type or size are designed and built to meet certain minimum safety standards under part 25 of Federal Regulations. Additionally, all aircraft, regardless of type or size , must operate under certain minimum standards specified by part 121 of the Federal Regulations. Certification of these aircrafts is predicated on the design and construction of the minimum requirements of the Federal Regulations. Components and/or areas of occupancy to be utilized safely during actual operation of the aircraft must also meet the minimum requirements of the regulations.

The wide-bodied aircraft, which entered service in December, 1969 had no regulations or policies governing lower lobe galley areas. The status remains the same today.

Regulations or policies governing lower lobe galleys must be established to ensure occupant safety in all types and locations of occupancy on an aircraft, regardless of whether such areas are used during take off, landing, or in-flight, or whether these areas are normally utilized by passengers or crew.

Since there are no regulations or policies in existence covering lower lobe occupancy, it appears the haphazard entry into service of the wide-bodied aircraft might be questioned as to the legality of the certification of the entire lower lobe galley area including the related operation of carts, lifts, etc. as outlined above.

The Air Line Pilots Association, Steward and Stewardess Division respectfully requests your immediate attention to the above.

I look forward to your comments.

Very truly yours,

Del R. Mott
Air Safety Coordinator

DRM/kb

cc: Claude S. Brinegar, Secretary of Transportation
John H. Reed, Chairman, National Transportation Safety Board
General Benjamin O. Davis, Assistant Secretary for Environment, Safety and Consumer Affairs
Robert Jones, Chief, Air Carrier Operations Branch, FAA
Nelson N. Shapter, Chief, Airframe Branch, FAA
Richard A. Davenport, Chairman, Flight Operations Evaluation Board, ANW-274, FAA
R. S. Stiff, Chief, Aircraft Engineering Division, WE - 100, FAA
Harry L. Eaman, Chief, Training and Technical Standards, FAA
All ALPA, Steward and Stewardess Division, Central Safety Chairman

ONA reports

Sent Letter with bill o/c.

JULY 5, 1973

DEL R. MOTT

HOME OFFICE

Attached is a copy of a report from a flight attendant on Overseas National Airlines in which I am sure you will be quite interested. Apparently, our combined efforts and the results thereof have already alleviated an emergency situation. We appreciate your cooperation in the achievement of this safety goal.

Xerox Sent to:

Al Bonner
JJ O'Donnell
Kelly Rueck
Mr. Sliff
Mr. Shapter
Mr. Jenkins
Mr. Davenport
Mr. Jones
Mr Carroll
C. Miller

June 13, 1973

To: Safety Committee

From: L. K. Jones

Subject: Escape Hatch on the DC-10

On June 8, 1973 my crew worked a flight from KJFK to EDDF on the DC-10. It was flight number 1660. After the seat belt sign went on for our landing at Frankfurt, the Galley girl and one of the observers on the flight prepared to return to the cabin, via the "P" lift.

We had two extra tray carriers which we placed in the "C" lift to send down to the lower galley. As we sent it down, the "C" lift jammed. We sent the "P" lift down so the girls could come up and it was very shakey. It went down to the lower galley very slowly and shook violently all the way down.

Once the "P" lift was down in the lower galley, the girls could not open the door. We brought it back up to the top and tried the door. It opened in the service center but the girls could not get it to open from the lower galley.

We notified the flight Engineer, but as they were going over their pre-landing check list he was not able to leave the cockpit. We were going to send a girl down to the lower galley in the "P" lift and open the door from the inside, but the "P" lift was so shakey and slow we were afraid that the girl in the lift would not be able to open the door from the inside and that it would jam completely and she would be stuck inside the "P" lift.

Both girls had to use the escape hatch to return to the main cabin.

We were told by ONA and McDonnell Douglas that it would be an impossibility that both the "P" lift and the "C" lift would be inoperative at the same time.

This instance proves the need for the escape hatch on the DC-10.

AIR CARRIER OPERATIONS BULLETIN NO. 73-19

SUBJECT: Problems associated with the introduction of lower lobe galleys in the wide-bodied jets

With the development of the jumbo jets came the lower lobe galleys. Although a lot of work went into the design and concept of having a galley in the lower section of the aircraft, very little thought was given to policies and procedures required for the new environment. Consequently, isolated problems appeared, and not being corrected, soon became common. Some of these problems eventually resulted in injuries to cabin attendants.

The following problems or discrepancies in procedures are listed, discussed and recommendations made to help the Principal Operations Inspectors to identify problem areas in his assigned air carriers' procedures and to help him to take remedial actions.

1. Problem: Passengers having access to the lower galleys.

   Discussion: We have received numerous complaints that passengers have been going down into the lower lobe galleys. They have either let themselves down in the lifts or have actually been taken down by Flight Attendants (F/A). There is no justifiable reason for passengers to be in the galley where they would interfere with the F/A duties. In addition, there is no provision for oxygen masks and safety belts for extra persons.

   Recommendation: That the air carriers incorporate into their manual prohibition against passengers being allowed in the lower lobe and so placard each lift.

2. Problem: Excessive number of cabin attendants in lower lobe.

   Discussion: Some air carriers have conducted training and/or instructions in the lower lobe during flight with five or six F/A trainees. They have also allowed deadheading crewmembers to occupy or visit the lower lobe in flight.

   Recommendation: Only two F/A should be allowed in the lower lobe at any time during flight due to the number of oxygen masks and seat belts. One additional person may be allowed for instruction, evaluation, or inspection duties.

3. Problem: Insufficient communication systems.

   Discussion: It is very difficult to hear the Public Address (P/A) system announcements in the galley. The reason for this is aerodynamic noise and noise emitted by the air compressors which are located nearby. The F/A working in the galley cannot hear a captain's warning of clear air turbulence or ten-minute warning of beginning of descent. In

addition, there have been reports of numerous failures of the intercom systems. Flight Attendants in the galleys have had to rely on the other F/As to pass the warning.

Recommendation: Increase volume of P/A system in lower lobes. Incorporate F/A procedures regardless if the communication is operable or not to assure that all warnings are passed to and acknowledged by persons in lower galleys.

4. Problem: Inadequate emergency equipment, procedures and training for combating fires in the lower lobe galleys.

Discussion: Recent en route inspections by Headquarters personnel revealed a nonconformity throughout the aviation industry in equipment and training for F/As who have to work in the lower lobe galleys. In one instance, there were adequate procedures and the attendant knew them well. However, the oxygen equipment that the F/A would have to wear did not include a full face oxygen mask. Needless to say, if there was a very smokey condition, the F/A could not see in order to complete her emergency procedures. In another case, there was a full face oxygen mask in the lower compartment but the F/A had no idea how to combat the fire. When asked how she would handle the emergency, she responded, "I would call the flight engineer." In no case were there any procedures for removing injured attendants from the lower lobe.

Recommendation: POIs should review their assigned air carriers' emergency procedures pertaining to the lower lobe to ensure that procedures and equipment are adequate and that training includes removal of injured F/A in the lower section. POIs should take into consideration the advisability of having the F/E away from his duty station during an emergency.

5. Problem: Inoperable lifts procedures.

Discussion: The MELs between the different aircraft (DC-10, L-1011 and B-747) are not compatible. In one instance, if the personnel lift is inoperable, no food service will be performed during flight. In another instance, the F/A may go down but the service is limited to a number of carts that can be delivered and stowed in the passenger cabin. Additional problems arise when the lifts become inoperable during flight.

Recommendation: POIs shall review assigned air carrier F/A procedures to assure that there are adequate instructions throughout their system on dispatching aircraft with personnel or cart lifts inoperable. Additionally, they should have a procedure in the event these lifts become inoperable during flight. Further assurance should be sought to determine that each carrier is keeping F/As informed on conditions and procedures which are set forth in the MELs that affect them.

6. Problem: Inadequate stowage of carts.

Discussion: Some airlines do not have a sufficient number of mushrooms in the cabin in order that each serving cart can be "tied down" in the event of turbulence. These carts can weigh up to 250 pounds and should be anchored when not being transferred to or from the cart lifts.

Recommendation: POIs should assure that the air carrier procedures and training include instructions to the F/As that all carts must be properly stowed for takeoffs, landings and whenever they are not being moved from one location to another.

7. Problem: Retractable mushrooms (tie downs) inoperable.

Discussion: The retractable mushrooms in the lower galley have been found inoperable. They are either jammed in the down position or when lifted to the up position will fall back down when the cart is placed over it. The automatic brakes are insufficient to keep the carts from moving about during takeoffs and landings.

Recommendation: Inspection should be conducted periodically in the lower lobe to see that the mushrooms are operable and that the procedures requiring each cart to be tied down or stowed are adhered to.

The above problems require immediate action. POIs and ACOIs should make a concentrated effort to review their assigned carriers' procedures. To ensure that the above recommendations are implemented, this area should be emphasized during en route inspections.

36-953 O - 79 - 13

F-27

SEATS -- Mohawk and Ozark Accidents

SUBJECT	LOCATION	IN EMERGENCY
Serious injury and death to two flight attendants who were in seats FAA was aware were dangerous.	Aft of aircraft (one left and one right) and both directly across from cargo.	Flight attendant responsible for evacuating all passengers aboard aircraft. (Only one flight attendant aboard this type aircraft.)

PROBLEM

Seat never met regulations under which it was type certificated (CAR 4.b.358).

HISTORY

Starts in 1966 when Mohawk representatives took matter to their company and the FAA, then progressed to the Mohawk accident when flight attendant was seriously injured and then 1973 an Ozark flight attendant was killed for the same reason the Mohawk flight attendant was seriously injured. (Both seats where ordered removed -- Mohawk, after the 1972 accident and Ozark after the 1973 accident.)

NOTE: Refer to the Association of Flight Attendants' documentation on Cabin Cargo for specific references regarding Mohawk and Ozark accidents as it applies to above subject.

FLIGHT ATTENDANT SEATS -- MOHAWK - OZARK

1. In the Mohawk case, the specific dangers of the seat were taken to the company in 1966. No action.

2. 1970 letter to FAA from AFA safety representative outlining that the F-27 seat did not meet applicable Civil Air Regulations.

3. 1970 letter from FAA to AFA states they feel seats meets regulations and dangers are not inherent.

4. Repeated letters from AFA Home Office to FAA from 1970 through 1976 referencing F-27 (amongst other seats) concerning lack of safety to occupants.

5. March 1972, flight attendant Segar severely injured as direct result of dangers involved with F-27 cabin crewmember seat and its location.

6. One week following March 1972 accident, seat restricted for use by FAA Directive.

7. March 1972, AFA again requested seat on opposite side of aircraft on Ozark F-27 be restricted for same reason.

8. Repeated requests to FAA in1972 and 73 to restrict use of Ozark F-27 similar cabin crewmember seat.

9. June 1973, FAA agreed there were deficiencies in the Ozark F-27 seat.

10. July 1973, Ozark accident occurred -- flight attendant assigned to seat in question killed.

11. July 1973, FAA restricted use of seat.

12. Time lapse on entire issue:

    (a) From initial correspondence to Mohawk and severe injury to flight attendant -- 1966-1972 -- seven years.

    (b) From time of correspondence to FAA from AFA representative to time of accident 1970-1972 -- three and one half years (four and one half years - in the Ozark case).

AIR LINE PILOTS ASSOCIATION
(Steward and Stewardess Division)
55TH STREET & CICERO AVENUE
CHICAGO 38, ILLINOIS
PORTSMOUTH 7-1400

AFFILIATED WITH A.F.L.-C.I.O.

INT'L

RD # Rainbow Apts.
Rome, New York 13440
October 17, 1966

Mohawk Airlines, Inc.
Oneida County Airport
Utica, New York

Dear Mrs. Berger,

It has become apparent since the introduction off the FH-227 that there are several conditions requiring immediate corrective action to insure that adequate safety standards have been met.

The stewardess jump seat while providing an additional revenue space in the cabin, is unsafe for the following reasons. The stewardess has no view of the cabin while seated there. The location of the seat puts the stewardess at the mercy of any luggage that can easily be thrown out of the luggage racks. The stewardess repeatedly bumps against the door rail when side loads occur during most take offs and landings. The small pad provided, is an indication that there is an awareness of the problem, but it is an unsatisfactory remedy.

The size of the carry on racks is insufficient to handle larger pieces of luggage, consequently bags must be stowed on their sides and stacked. The single strap across each shelf is sorely inadequate to cope with the deacceleration of landings. The top rack has a strap reaching completely across the cabinet containing the first aid kit and fastening in a small area between the door mechanism and the carry on rack. This is not necessary and makes the first aid kit difficult for quick removal.

The arrangement of securing coffee jugs is a poor "make shift" affair. The single elastic shock cord catching only on the bottom of the container and at an angle in no way secures it in position in the event of side forces or acceleration. During flight it is necessary to move the coffee jug forward to use it. Therefore there is no restraint at this time.

There is a decided inconvenience and hazard in having the lavatory door open directly on the galley work area. More important, however, is the way this door, if thrown open, will effectively block access to the rear emergency door exits. This becomes an even more effective block when luggage is strewn about the aft area from the already mentioned carry on rack.

The placement of the CO_2 and H_2O fire extinguishers means that to remove one in case of fire the stewardess must first move the passengers to fold the seats forward, reach through a tangle of magazines and probably around a hanging garment bag before starting to remove the extinguisher. It is urgently recommended a new location be found for these extinguishers

which will guarantee quick accessability at all times.

Another area of concern is the repeated bumping of passengers' heads on the top frame of the main entrance door. The problem could be lessened to some degree by a visual warning, plus a removable pad to cover the sharp edge of the door frame.

It is urgently requested that Mohawk Airlines promptly note these problems, and take proper remedial action. Prompt corrective action by the company will demonstrate its stated primary interest in air safety.

Sincerely yours,

/s/ Diane Massar
Central Air Safety Chairman
S & S Division

cc: J. Mozian, Air Safety Chairman
N. Ciancetta
D. Baker, MEC
D. Pollard, ALPA Engineering
H. Pryor BUF
V. Van Patten BOS
B. Kossove JFK
M. Reilly EWR

JUMP SEATS

Entire Letter

NOTE	FILE	DEPARTMENT	Initial
		President	
		Exec. V. P.	
		Pres. Sec'y	
		Pres. Asst.	
		Accounting	
		Membership	
		Council	
		Agreements	
		Engineering	
		Statistical	
		Legal	
		Publicity	
		E & O	
		Personnel	
		Purchasing	
Bring-up		By	

4 Oak Terrace
Georgetown, Massachusetts 01833
September 18, 1970

Mr. Robert Jones
Boston Regional Office
Federal Aviation Administration
154 Middlesex Street
Burlington, Massachusetts 01803

COPY

Dear Mr. Jones:

As the ALPA Steward and Stewardess Division Central Safety Chairman for Mohawk Airlines I would like to acquaint you with an area of deepest concern to the stewardesses on Mohawk Airlines who are flying the Fairchild 227 equipment. This area of concern is in regard to the stewardess jump seat on board the above mentioned aircraft.

This seat is located near and attached to the rear lavatory wall facing aft. It is directly opposite the passenger carry on baggage rack and no more than 4" away from the rear passenger stairs when they are retracted. The seat is positioned in such a way that it is quite objectionable for stewardess use. The reasons are as follows:

1. The stewardess could fall over sideways during turbulence.

2. Stewardess could strike head and arms on the stairs during turbulence or hard landings.

3. An injury could be received due to objects becoming dislodged from carry on rack (opposite stewardess' jump seat).

4. Jump seat could collapse due to vertical stresses.

5. Seat is not protected against inclement weather and as a result the jump seat, the seat belt, and the floor in the area become slippery and wet.

6. The stewardess has no view of the passenger cabin while using the seat.

7. The stewardess has no view outside of the aircraft.

8. The jump seat has inadequate padding and by no means offers any protection against crash forces. (This is a definite area of concern since the stewardess is sitting in an area next to 2 floor level door exits.)

Would it be possible for someone from your office to re-evaluate this stewardess jump seat in the hope of either relocating it, or redesigning it with survival in mind?

Sincerely,

Eleanor Schneider
Central Safety Chairman
Mohawk, S&S Division

ES/bb

cc: Mr. Ciancetta
Mr. Golden
Mrs. Mott

Entire Letter

AIR CARRIER DISTRICT OFFICE
Oneida County Airport
Oriskany, NY 13424

20 November 1970

Miss Eleanor Schneider
Central Safety Chairman
Mohawk, S&S Division
Air Line Pilots Association
Munsey Building, 1329 "E" Street, N.W.
Washington, DC 20004

Dear Miss Schneider:

We have investigated the conditions brought to our attention in your letter of 18 September 1970 concerning the stewardess jump seat and the carry-on luggage rack on the FH-227 aircraft. We have spoken to each item (1 through 8) and anticipate that the following answers will satisfy your concern:

With reference to Items 1 and 2 of your letter -- The stewardess jump seat installation on the Mohawk FH-227 aircraft is similar to installations on other air carrier aircraft except for location. The door rail shoulder padding (and safety belt) was required during FAA type certification of this aircraft to preclude injury to the occupant of the seat during turbulence and hard landings.

With reference to Item 3 of your letter -- The carry-on luggage rack opposite the stewardess seat originally had a single strap. This has since been re-designed to a two strap configuration. This compartment is intended for luggage and luggage-size objects only stowed vertically. No small objects should be carried in this compartment. If the straps are slack to a degree that would allow rack contents to escape during deceleration, the aircraft should not be released until the strap has been correctly adjusted.

With reference to Item 4 of your letter -- The stewardess jump seat is designed for an occupant weight of 170 pounds with due account taken for maximum loads which include vertical stresses. Since FAA type certification of the Fairchild F-27 aircraft, the jump seat has been modified in accordance with FAA Airworthiness Directive 67-8-5 to assure structural integrity. This modified seat is used on the FH-227 aircraft.

With reference to Items 5, 6 and 7 of your letter -- We agree that the location of the seat near the passenger door is less than ideal since this area is exposed to the weather with the door open. This is a complaint on several aircraft where the cabin is small and the stewardess seat is located near the entrance door.

With reference to Item 8 of your letter -- The aft facing seat is designed so that a person is protected against injury due to deceleration forces resulting from an emergency landing taking into consideration the "G" forces as outlined in CAR 4b under which this aircraft was certificated.

The conditions outlined in your letter have been periodically discussed with Mohawk Airlines since 1967, and have resulted in improved carry-on rack retention straps with added restrictions on what can be stored in the carry-on rack. Therefore, while we feel that the location of the jump seat is not ideal, we do not think enough new material has been presented to warrant another modification of the seat or its relocation.

Mohawk Airlines has allowed the stewardess to occupy the aft inboard seat for her position whenever there is less than a full load of passengers. This is outlined in their manual and does alleviate the condition on most flights.

We appreciate your concern in this matter and anticipate that this reply will alleviate your concern with respect to the safety of stewardesses assigned to FH-227 flights.

Sincerely,

Jennings O Larson

JENNINGS O. LARSON
Chief

AIR LINE PILOTS ASSOCIATION
(Steward and Stewardess Division)
MUNSEY BUILDING, 1329 "E" STREET, N.W.
WASHINGTON, D.C. 20004
(202) 347-2211
AFFILIATED WITH AFL-CIO.

INT'L

March 8, 1972

June 13, 1973
Kansas City
Hearing

Mr. Nelson Shapter
Chief, Airframe Branch
Flight Standards Service
Federal Aviation Administration

Dear Mr. Shapter:

Confirming our telephone conversation on March 7, 1972, the ALPA Steward and Stewardess Division requests that use of the flight attendant's seat or seats on the MOHAWK and OZARK FH-227's, or any other FH-227 with a flight attendant seat in the same position, be restricted pending the final outcome of the MOHAWK Albany, New York accident investigation.

As I stated on March 7, 1972, the safety representatives from both airlines (since 1966) have repeatedly documented their concern to their companies and the FAA due to the possible injuries or death that could result from the obviously unsafe features of the FH-227 seats – protrusion of the stairway two to three inches from the right side of the flight attendant's head without adequate padding; inadequate restraint straps for carry on baggage stowed directly facing flight attendant; and inadequacy of the seat structure itself which includes inadequate (OZA) and no (MOH) back support.

We make this request in view of the injuries received by the flight attendant Mrs. Segar in the MOH Albany accident. Her condition is quite serious and includes severe head injuries, chest injuries and a broken vertebrae. The type of injuries she received certainly justify our previous complaints and this request for restriction.

Both the Ozark and Mohawk files in our office contain reports of various injuries on the FH-227 flight attendant seat -- from seat collapses, to flight attendant hitting head on the stairway, luggage coming through the two-strap restraint system; as well as flight attendant and seat retraction problems.

We request that any FH-227 flight attendant seats which directly face or are next to cargo bins be restricted for use by any person pending the final outcome of the Mohawk accident investigation; and that the nearest passenger seat to the Type I exit be reserved for the flight attendant's use.

We would appreciate your immediate reply.

Very truly yours,

(Mrs.) Del R. Moff
Air Safety Coordinator

DRM/b

FH - 227 FLIGHT ATTENDANT SEATS OZARK AIRLINES

AFT FACING JUMPSEAT

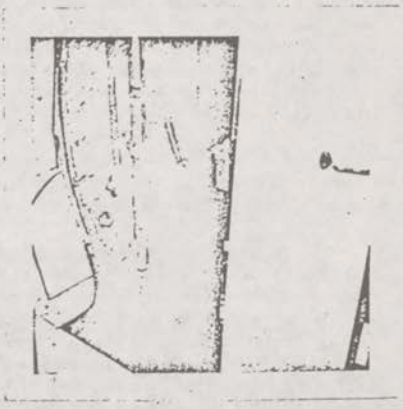
1. FH - 227 Flight Attendant Seat left side. Restricted March, 1972. Picture used to illustrate red bar not in position.

2. Right side flight attendant seat. Red bar in position.

3. Right side flight attendant seat in stowed position. NOTE: Seat folds down and flush with galley bulkhead.

4. Flight attendant seated in jumpseat right side. NOTE: Door actuating mechanism. Also note door handle.

5. Flight attendant seated in jumpseat right side. NOTE: Closeness of flight attendant's right knee to folding door. Distance from forward edge of flight attendant seat to folding door for position for takeoff is 12 inches. If door is removed, distance is 14 inches. ALSO NOTE: Unpadded edge of seat pan.



6. Cargo bin directly in front of and facing flight attendant. Webbing spaces are 8 inches square. Not pictured is unenclosed area from ceiling to first strip of webbing. Distance from ceiling to top row of webbing ranges from 8 to 11 inches.

HAZARDS ASSOCIATED WITH

FH - 227

FLIGHT ATTENDANT JUMPSEAT AFT FACING

(Right side of aircraft adjacent to cargo loading door)

(1) Flight attendant seat attached to galley structure.

(2) Flight attendant seat originally held in place for occupancy by one strut (placed at a 45 degree angle) which repeatedly dumped flight attendants on the floor. Retro fit consisted of a red bar to assure seat would not collapse. With installation of red bar, while in use, seat became permanent fixture because after seat is positioned (pulled up from bulkhead) for occupancy, the bar requires the following steps to release the seat back flush along the galley wall structure:

A. The flight attendant must unfasten seat belt.
B. The flight attendant must physically remove herself or be be removed from the seat.
C. The red bar must be moved from one notch to the other.

When the flight attendant seat is placed into position for occupancy, the red bar is a permanent structure to assure that the seat will not collapse.

(3) When a folding door which normally closes off the cargo area from view of the passengers during boarding is opened and secured (this door is a floor to ceiling folding door, which secured for takeoff and landing is partially on the right of the flight attendant, where her right leg is positioned. The distance between the edge of the flight attendant seat and the folding door structure is 12 inches, which is in violation of FAR 25.813.

When the seat is placed into position for occupancy and the red bar attached, the edge of the left side of the seat (or where the flight attendant left leg would be) is 22 inches from the cargo netting. However, the obstruction remains to the right side.

(4) As per #2 and #3 above, there is no compliance with Federal Air Regulation 25.813. FAR 25. 813 states as follows: "(a) There must be a passageway between individual passenger areas, and leading from each aisle to each Type I and Type II emergency exit. These passageways must be unobstructed and at least 20 inches wide (Revised 25-15, October 24, 1967)." "(b) For each passenger emergency exit covered by #25.809 (f), there must be enough space next to the exit to allow a crewmember to assist in the evacuation of passengers without reducing the unobstructed width of the passageway below that required for the exit. (Revised 25-15, October 24, 1967)".

THE FLIGHT ATTENDANT, WHILE SEATED IN OR NEXT TO ANY ACCESS TO MAJOR TYPE I OR II EXITS, IS HERSELF, AN OBSTRUCTION. ON THE OZARK FH-227 AND OTHER AIRCRAFT, WHERE A FLIGHT ATTENDANT MAY BE SEATED SO AS TO OBSTRUCT PASSENGER EXITING, CONSIDERATION SHOULD HAVE BEEN GIVEN TO ASSURE THE REQUIRED 20 INCH ACCESS WITH THE FLIGHT ATTENDANT SEAT OCCUPIED. NO GUARANTEE CAN BE MADE AS TO THE PHYSICAL CONDITION OF THE FLIGHT ATTENDANT FOLLOWING AN ACCIDENT.

ABSOLUTELY NO CONSIDERATION WAS GIVEN TO THE FACT THAT THE PASSENGERS (1) IF THEY DID REMOVE AN INJURED FLIGHT ATTENDANT FROM THE SEAT (2) WOULD KNOW HOW TO RELEASE THE RED BAR TO DROP THE SEAT IN ORDER TO CLEAR THE PASSAGEWAY TO THE EXIT.

IF AN OCCUPIED JUMPSEAT DETRACTS OR BLOCKS COMPLETELY FROM THE NECESSARY ACCESS TO EXITS REQUIRED BY THE FEDERAL REGULATIONS, THEN THAT JUMPSEAT MUST BE RESTRICTED FROM USE BY ANYONE AND THE FLIGHT ATTENDANT MUST BE SEATED IN A SAFE LOCATION.

(5) Flight attendant's head is in direct line with door structure and components necessary to operate such door. Normal position of flight attendant's head is 18 inches from the door track to her left. Normal position of flight attendant's head from the door actuating handle is 22 inches.

(6) Flight attendant seated directly across from cargo bin. Opening in the netting 8 inches by 8 inches. The first line of netting containing cargo ranges from 8 to 11 inches from the ceiling of the aircraft, thus allowing cargo to come over the top of the netting and striking the flight attendant during turbulence or emergency situations.

(7) Poles holding cargo netting are not positioned to assure restraining of cargo under crash conditions.

EXHIBIT F

Fraternal Association
Safety + Standards
Division

Interstate + Foreign Commerce
Special Subcommittee on Inv. + Oversight

Our third aircraft accident investigation with the NTSB involved the Ozark Airlines FH-227 crash in St. Louis July, 1973. This airplane crashed into a wooded area on the approach to Lambert Field. It was apparent after participation in both the field and public hearing phases of the investigation, that there were three extremely serious questions that had to be asked. Those questions were,

1. The availability of shoulder harnesses for flight crews.

2. The crashworthiness standards for stewardess seating.

3. The crashworthiness standards for passenger seating.

During the investigation, the Association became acutely aware of the three problems and further research quickly demonstrated FAA failure to not only abide by NTSB recommendations, but great resistance to repeated warnings and long term efforts by the Airline Pilots Association (ALPA) to effectuate change. ALPA has provided us with much valuable documentation and commentary on their experiences with the failure of the FAA to act on crutial issues that affected not only crew survival, but passenger safety as well!

On July 27, 1973, in a letter addressed to Mr. John H. Reed of the NTSB, ALPA posed the recurring question,

> "If we are required and trained to provide lifesaving leadership in emergencies to our flying public, I then ask this question: Why are our pleas ignored until a fatal crash proves the legitimacy of our complaints?"

As ALPA will attest, the Ozark crash in St. Louis had precedence in the fatal crash of another FH-227. this time it was a Mohawk Airlines aircraft. That aircraft also landed short of the runway. The Board in its report of the accident reflected on the death of both pilots because of the absence of shoulder harnesses in the cockpit seats.

> "This accident offers another example of the need for the installation and use of shoulder harnesses by cockpit crewmembers. Even though the crash forces were generally in excess of the design standards of the existing restraint system, they were within

> the limits of human tolerance. This is not an unusual condition, since crash dynamics produce localized decelerations and deformed structure in relatively unpredictable patterns. The Board has previously supported the installation and use of shoulder harnesses and continues to do so."

The Mohawk Accident Report is rampant with facts and figures on survivability issues. The message put forth by the Board on shoulder harnesses is crystal clear, yet two pilots sustained serious injuries in the subsequent crash of the Ozark FH-227 for the very reason that harnesses were not yet installed on the Ozark airplane. Because of needless FAA procrastination, two pilots were senselessly injured. The AMFA will state, and restate; much death and injury resulting from aircraft accidents is preventable and the FAA has power and Congressional mandate to do everything in its power to circumvent this mindless toll, yet it is agonizingly slow or outright reluctant to force changes in airline policy, or regulatory language to prevent further losses. The installation of shoulder harnesses in civil transport aircraft is not a technological problem; it is an internal institutional barrier within the FAA itself.

The issue of shoulder harnesses for flight crew safety highlights the need for some remedial mechanism to force change in face of obvious hazards that have been neglected by the FAA. Unfortunately, one means that is available is litigation against the FAA. This has proved to be quite successful on several issues, yet the Association believes that this represents a desperate last step type of measure. We believe that an appeal type of procedure should be designed, with initiation by interested members of the public and final ruling on the merits of the appeal by the Board itself. In reading Senate Bill 2401, [a Bill to reorganize the NTSB we find that such an appellate mechanism that we recommend is missing, consequently a reorganized NTSB will encounter similar problems relative to FAA follow-up on Board recommendations. We believe that our exhibit 34 will illustrate the obvious problem of FAA follow-up to Board recommendations.

The Ozark crash provided another dubious string of FAA failures to constructively react to air safety hazards. During the process of investigation the issues of flight attendant safety were raised with particular emphasis on the stewardess seats in the FH-227 aircraft of both Mohawk and Ozark. Exhibits 36 through 45 will show that ALPA tried for over seven (7) years to implement change on these critically important safety issues! The Association is shocked at this example of FAA negligence. We are particularly outraged at this because our stewardess at Ozark perished in that crash and the survivability issues that ALPA continually brought to the attention of the FAA finally produced a verification that could be understood . . . . someone died in a crash!

As early as 1966 the FAA was notified by ALPA that many safety hazards existed on Mohawk aircraft. Again in 1970 the Administration was alerted to the many serious problems encountered by flight attendants and very specific mention was made on stewardess seating. The seat finally underwent a minor modification required by an airworthiness directive and again ALPA was "assured" by the FAA that the seat was completely airworthy and able to protect the stewardess during a crash.

Still, ALPA felt that the flight attendants environment, in general, offered substantial threats to safety, especially in light of an airplane crash. After continuous complaints, the FAA relented and produced a investigation of all of the items brought to its attention by ALPA. It must be duly noted that the FAA was not the prime mover in this industrial survey, it was ALPA. The net result of the survey indicated major safety problems with flight attendant seats, safety belts, head protection, hazardous objects, galleys, oxygen equipment, megaphones, public address systems, galley and exit area flooring, storage spaces, seat belt signs, passenger restrain straps, evacuation slides, exits, etc. The survey results lucidly indicate a lack of active regulatory activity by the FAA by the mere fact of the existance of all of these hazards!

Yet, in the same time period when this survey was being completed, the stewardess in the Mohawk crash at Albany suffered severe injuries due to the continued dangers of her operational environment. The FAA "assurance" by their Utica office was, in fact, a patronizing statement. The NTSB Accident Report lay bare the essential truth of the situation;

> "The stewardess received injuries caused by the collapse of her seat and by striking her head on the door actuating mechanism. The loads imposed on the seat exceeded the design limits. However, her head injuries were caused by the fact that the seat installation was too close to the door mechanism".

Once again, after the Mohawk crash, ALPA addressed the FAA on these serious problems, seating included. In June of 1973 ALPA warned the FAA on the right hand stewardess seat on Ozark aircraft, [an almost identical situation to the Mohawk airplanes]. Once again, in June 1973 ALPA met with the Administration in Kansas City and reiterated it concern on the Ozark stewardess seating hazard. Typical FAA follow-up failures pursued this meeting. Complaining to the NTSB on this, ALPA stated in its correspondence that;

> "At this meeting it was, in fact, determined that certain dangers did exist concerning the flight attendant jumpseat. In view of the findings

> at this meeting, it was understood that the St. Louis District Office of the FAA would write a letter to Mr. Rees, president of Ozark, concerning the FAA findings and the improvements needed. This office has no copies of the correspondence or proposed correspondence."

Approximately one month later, in July of 1973, an Ozark Airlines FH-227 crashed into a wooded area on approach to the St. Louis airport. The stewardess was killed. The hazards of the flight attendants environment that ALPA continually strove to correct finally produced the 'justification' for FAA action! AMFA believes that the frustration of seven years of effort by the pilots union is summed up in their letter to the NTSB [Exhibit 45];

> "The hazards; i.e., actual jumpseat collapses, injuries, cargo dislodgements, ect., directly related to these jumpseats have been documented since 1966 on the Mohawk and Ozark FH-227 aircraft. Virtually every proper, legal and moral procedure has been pursued by the ALPA representatives to no avail."

References:

NTSB Aircraft Accident Report (Mohawk Airlines FH-227, March 3, 1972) AAR-73-8

Exhibit 19 FAA correspondence to Charles Miller, NTSB (cover letter on F/A safety survey)

Exhibit 20 FAA Survey: "Safety Aspects of the Flight Attendants Environment".

Exhibit 21 extracts from NTSB Aircraft Accident report on Mohawk crash.

Exhibit 22 Mohawk FH-227 seating diagram

Exhibit 23 Ozark FH-227 seating diagram with details of approximate survivable areas.

Exhibit 24 NTSB investigation exhibit. Crash survivability report of Ozark crash.

Exhibit 25 Photograph. Showing lower side of FH-227 [Ozark] with general fuselage structure intact. (aft section)

Exhibit 26 Photograph. Showing seat tracks with all seats separated.

Exhibit 28 NTSB letter to Administrator Shaffer. (concerning need for crew shoulder harnesses.)

Exhibit 29 NTSB Safety Recommendation 73-66. (concerning FH-227 flight attendant safety.)

Exhibit 30 Captains' letter on shoulder harness problem on FH-227 aircraft.

Exhibit 34 Copy of Aviation Daily. Conflicts of FAA follow-up on NTSB recommendations.

Exhibit 36 Correspondence from Stewardess Massar to Utica FAA.

Exhibit 37 Correspondence from Stewardess Schneider to Boston FAA.
Exhibit 38 FAA correspondence to ALPA Stewardess Schneider.
Exhibit 39 Correspondence from ALPA Coordinator Del Mott to Stewardess Schneider.
Exhibit 40 Correspondence from ALPA Coordinator Del Mott to FAA, Mr. Nelson Shapter
Exhibit 41 Correspondence from FAA to ALPA Coordinator Del Mott. (Ozark stewardess seating.)
Exhibit 42 FAA telegraphic Airworthiness Directive on FH-227 stewardess seating.
Exhibit 43 Correspondence from ALPA Coordinator Del Mott to FAA, Mr. Kenneth Tunjian. (N.Y.)
Exhibit 44 Correspondence from ALPA Coordinator Del Mott to NTSB, Mr. Francis McAdams.
Exhibit 45 Correspondence from ALPA Coordinator Del Mott to NTSB, Mr. John H. Reed.

June 9, 1972

Mr. Kenneth Tunjian
Department of Transportation
Federal Aviation Administration Eastern Region
Federal Building
J.F.K. International Airport
Jamaica, New York 11430

Dear Mr. Tunjian,

My assistant, Mrs. Boadwine told me you requested reports we have regarding the Ozark FH227 now in use (the right hand side of the aircraft.)

I have enclosed a number of reports for your information. Most pertain to the reports we have received on the jumpseat now in use on the FH227. Prior to the issuance of the Aviation Directive in March. The left seat was required for the flight attendant, therefore we have no reports on the right seat prior to March 1972.

Additionally you will find a few reports of problems related to the DC-9's flown by Ozark which are merely for your information.

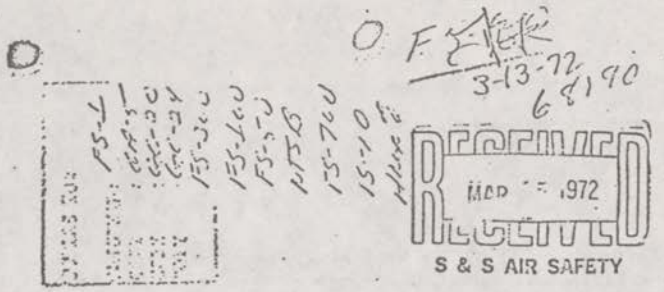
As you will note, we have removed the names of those who have written these reports for obvious reasons.

We appreciate your attention to this matter and apologize for not having any additional photographs, however, those we retain must be used for our files. Hopefully, the photos sent by Mr. Grochal will be of assistance to you and those you may keep if you wish. I know that Miss Dorkowski would be willing to take more photographs for you if necessary.

Very truly yours,

(Mrs.) Del R. Mott
Air Safety Coordinator

cc Miss Dorkowski



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11 MAR 72 06 10Z

Modification assessment or approval

July 27, 1973

The Honorable John H. Reed
Chairman of the Board
National Transportation Safety Board
800 Independence Avenue, S. W.
Washington, D. C. 20591

Dear Chairman Reed:

Directly following the Mohawk FH-227 accident in Albany, New York, March 3, 1972, I wrote a letter to Mr. Nelson Shapter, Chief, Airframe Branch of the FAA requesting (1) immediate restriction of any flight attendant jumpseat which directly faces or is next to cargo bins and, (2) that the nearest passenger seat to the type I exit be reserved for the flight attendant's use. In that letter I specificially stated "that the safety representatives from both Mohawk and Ozark had repeatedly documented their concerns to their companies and the FAA due to the possible injuries or deathsthat could result from the obviously unsafe features of the FH-227 jumpseat". The (left) flight attendant seat, only, was then restricted.

Flight attendants are responsible for the safety of the passengers whose lives are entrusted to them; they are also required by law to provide this function on commercial aircraft. Yet, basic environmental safety has not been provided to flight attendants on the FH-227. After repeated meetings and correspondence (each with documentation andphotographs provided), between ALPA and the Washington, Boston, Kansas City, St. Louis and New York offices of the FAA; as well as repeated meetings between ALPA and Ozark Airlines, the flight attendant jumpseat (on the right side of the FH-227 aircraft) still remains as the assigned jumpseat. The hazards; i.e. actual jumpseat collapses, injuries,cargo dislodgments, etc., directly related to these jumpseat have been documented since 1966 on the Mohawk and Ozark FH-227. Virtually every proper, legal and moral procedure has beenpursued by the ALPA representatives to no avail.

During the public hearing of the Mohawk accident, I queried Mr. Nelson Shapter as to why the flight attendant jumpseat on the left (only) had been restricted following the accident when Ozark had a flight attendant jumpseat on the right which had the same dangers as the left seat. Mr. Shapter testified that he was not aware that Ozark had a seat which was located across from a cargo bin and from where the flight attendant could strike her head on a door handle. (Actual questions and answers can be found in the transcript of the hearing for the Mohawk accident.) Mr. Shapter then stated he would have his people look into the matter.

The early part of June, 1972 a Mr. Tunjian from the New York, FAA Office contacted my office requesting information concerning the Ozark FH-227 right jumpseat. June 9, 1972, I forwarded reports along with a cover letter to Mr. Tunjian in response to his request. Photographs of this seat were sent to him by the Washington FAA Office prior to his receipt of my letter.

Ozark and ALPA Safety representatives met repeatedly throughout 1972-1973 (reports retained in ALPA Home Office files) concerning this jumpseat.

June 12, 1973 FAA personnel held a meeting with ALPA in Kansas City concerning the carriage of Hazardous Materials and the use of the right flight attendant seat on Ozark FH-227. At this meeting it was in fact determined that certain dangers did exist concerning this flight attendant jumpseat. In view of the findings at this meeting, it was understood that the St. Louis District Office, FAA would write a letter to Mr. Rees, president of Ozark concerning their findings and the improvements needed. This office has no copies of the correspondence or proposed correspondence.

Chairman Reed, you and your staff are well aware of the repeated efforts, verbal requests, correspondence and written documentation our organization has made to provide the public the lifesaving leadership they deserve in any emergency situations. We have documented these facts with you, the FAA and the individual airlines and these efforts have not limited themselves to the FH-227, but included to many other aircraft. The deficiencies of jumpseats, and especially those on the FH-227 on both Mohawk and Ozark were evident long before the Albany crash and even more obvious before the most recent Ozark accident in St. Louis. It is extremely disturbing that the airline industry and the Federal Government, even though they are aware of the dangers inherent with these jumpseats, will continue to admit the deficiencies but neither will make nor require change because "no serious injuries have occurred". In other words no near death or deaths have occurred, therefore, it has not been proven unsafe.

As an example, we waited for 6 years following head injuries to a flight attendant in the Ozark 1968 Sculx City accident before implementation of an NTSB recommendation was accomplished on the DC-9-10 to remove the protruding assist handle just to the right of the flight attendant's head. Why was it necessary for us to wait until the near death of Mrs. Segar in the Mohawk crash in 1972 to have the left flight attendant seat removed from the FH-227. Why, when we have repeatedly documented evidence of the dangers of the right seat of the Ozark FH-227 did we again wait for serious injury or a death? What will be done now?

We request your immediate attention to and restriction of the right flight attendant seat of the Ozark FH-227 and request that the flight attendant be permitted to reserve and occupy the

last passenger seat, left aisle side in the FH-227. We realize the total number of deaths attributed to this particular accident and we are not professing that the flight attendant could have provided assistance and/or leadership had she occupied the aforementioned seat, however, the strong evidence of hazard was presented long prior to the Ozark accident. Both FH-227 jumpseats are obviously unsafe and restriction of these seats should have been as a result of logic and documentation to say nothing of basic safety principles.

In closing, Chairman Reed, we urgently recommend specific action by the National Transportation Safety Board concerning (1) Prohibition and discontinuance of the use of the Ozark FH-227 aft jumpseats and (2) immediate NTSB "re-evaluation" with prohibition and discontinuance of the use of any flight attendant jumpseats on all other aircraft with obviously inherent dangers: and; (3) that any such jumpseat will not be reinstated until all aspects of safety (including surrounding environment) are proven equal or better in protection to that provided for passenger use. Immediate investigation by NTSB should include the structural integrity of the seat; attachment hardware; the durability of bulkheads or galleys to which seats are attached; hardware, equipment, or solid structures within striking range of the head; inadequate securing devices of equipment, carry on racks, coffee pots, etc.; proximity of flight attendant's (required) seat to nearest assigned exit; protruding handholds or handles with in striking range of the head; lack of required (FAA) 20 inch access to major type I exits when seat is in the position for occupancy; and any other related safety aspects that should be considered. This office will be glad to provide any necessary assistance; both from ALPA Home Office staff or that of our ALPA appointed safety officials in the field.

Further examples of current deficiencies are jets (i.e., 707's, 727's) rolling off the production lines TODAY with unsafe flight attendant seats (customer option) "because that aircraft was type certificated before certain present applicable regulations became effective" or "since FAA certificated the particular seat, it must be considered to meet all regulations and is therefore safe". FAA personnel have admitted that some flight attendant seating arrangements are indeed dangerous.and have stated that employees of the manufacturers and companies (FAA inspector designees) have indeed certified these hazardous seats. The manner in which these seats and their location (i.e. environment) were certificated, including the manner of designating certificating personnel demands re-evaluation and upgrading. In addition, outmoded specification under which flight attendant seats were certificated demand reassessment and upgrading.

The current state of the art provides not the technology and the design to allow retrofit of the present day aircraft. This retrofit would allow our passengers the lifesaving leadership they deserve and would involve only an honest "re-evaluation" of many of these jumpseats by the NTSB regardless of the date of the aircraft type certification. "Re-evaluation" and retrofit is the only action possible, because to conduct an investigation of the known dangers and to

document these deficiencies as the FAA did in 1971 and hope for voluntary enforcement or upgrading of the flight attendant seats and surrounding areas is to stick one's head in the sand and hope all the deficiencies will go away....they have not and they will not.

Attached you will find photographs and a brief list of specific dangers as previously presented to the airlines and the Federal Government concerning the flight attendant jumpseat of the FH-227.

If we are required and trained to provide lifesaving leadership in emergencies to our flying public, I ask one question: "Why are our pleas ignored until a fatal crash proves the legitimacy of our complaints?"

Very truly yours,

(Mrs.) Del R. Mott
Air Safety Coordinator

DRM/kb

cc: C. S. Brinegar, Secretary of Transportation
B. O. Davis, Assistant Secretary for Environment
A. Butterfield, Administrator, FAA
Senator H. Cannon
Congressmen J. Brooks

BNF B-727

ISSUE:

"SIDE GALLEY JUMPSEAT" --

Whether the side fold-down jumpseat attached to galley bulkheads meets certification requirements and if not, thereby creates a potentially hazardous situation by placing the lives of flight attendants and passengers in jeopardy should an accident occur.

HISTORY:

Association of Flight Attendants has historically fought against unsafe seating conditions for flight attendants. When the side galley jumpseat was approved for installation on April 9, 1971, it added yet another thorn in the side of AFA's battle against potentially hazardous seating structures and environments. It has been an uphill fight which finally came to a head during the February, 1976 Congressional Hearings on In-Cabin Safety.

Ms. Del Mott, AFA's Air Safety Director, testified the following:

> "Reluctance of the FAA to consider safety for all occupants aboard the airplane threatens the safety of everyone directly and indirectly. Dangers of the cabin crew members' seating have been brought to FAA's attention for over 15 years. Jumbo aircraft incorporated better flight attendant seating, but the 200 jumbos are a small percentage of the airplanes we will continue to fly for many years to come. It is those 2,000 regular or narrow-bodied airplanes such as the 707, DC-9's and 727's, et cetera, that present the real danger. These planes have flight attendant seats tucked in corners, attached to galleys and partially in coat closets. We realize the potential fire danger and the necessity to evacuate passengers expeditiously. If we do survive, there are deficient latching mechanisms on containers holding heavy items, which will come loose and hit us. We are still faced with the unusable exit because the galley components and debris block these exits. Additionally, the emergency lighting fails, our seats fold up and pin us in. Compartments fall on us, and the cargo comes loose from the seats.
>
> "For this reason we have been emphatic in insisting that our seats and surrounding environment be re-evaluated to provide better protection to us, so that we may provide better protection to you, the passengers."

The elimination of the side-facing jumpseat was the only success brought about by the Congressional Hearing. In 18 years of study by the FAA, virtually no other action with respect to flight attendant seating, environment and related dangers, has been taken.

In June of 1976 Ms. Mott requested the assistance of Braniff Central Safety Chairperson in bringing again to the attention of the FAA and her Company the deficiencies of the side galley mounted jumpseat used on their B727-100, B727-200, and some DC-8 aircraft. They are:

1. No padding for the head; no back or spine support; the attach point is within striking radius of the head.

CAR 4.b. 358 states:

> "Passengers and crew shall be afforded protection from head injuries by one of the following means, (i) Safety belt and shoulder harness which will prevent the head from contacting any injurious object, (ii) Safety belt and the elimination of all injurious objects within striking radius of the head, (iii) Safety belt and a cushioned rest which will support the arms, shoulders, head and spine. (3) All projecting objects which would cause injury to persons seated or moving about the airplane in normal flight shall be padded."

The seat in question has a shoulder harness and safety belt, but this does not prevent the occupant's head from contacting any injurious object...e.g. the shoulder harness attach point; therefore, the seat does not meet (i) above. The shoulder harness attach point is not removed; the seat, therefore, does not comply with (ii). There is no support which supports the arms, shoulders, head and spine so (iii) is not met and the projecting object (shoulder harness attach point) is not padded.

2. There is no oxygen provided for the side jumpseat on the 727-100 series Regardless of Braniff's policy to restrict the cabin to 106 passengers, this seat is in direct violation to FAR 25.1447, which states:

> "There must be an oxygen-dispensing unit connected to oxygen supply terminals immediately available to each occupant, wherever seated."

Concentrating specifically on the requirement for immediately available oxygen-dispensing units connected to supply terminals, it is obvious to assume that FAR 25.1447 speaks to the design of the aircraft since the aircraft will be operating at and above specific altitudes. Therefore, the argument that a particular segment of a flight does not go over the 25,000 foot level is an invalid one. If the aircraft, when designed, is intended to fly at and above certain flight levels, then FAR 25.1447 must be met.

The seat is located on the galley bulkhead of both the 727-100 and 727-200 series, where it is likely components will jar loose in a crash, and probable that the bulkhead itself will give way.

With the high probability of the flight attendant being seriously injured or killed on this seat, access to both the galley door and forward loading door would be blocked and evacuation seriously hampered Many passengers' lives would be needlessly endangered.

Mr. Richard F. Chandler, Chief, Protection and Survival Lab, C.A.M.I., has this to say about possible injuries relating to the side jumpseat:

> "The possible injuries relating to the occupant of the seat would most likely result from the low back and/or relative lack of torso restraint in the left lateral direction. The low seat back could be critical if a hyperextension reaction occurred, as might exist if the torso rebounded toward the seat back due to the elastic properties of the restraint system. Even if the seat back failed, as might be desirable in such an event, continued rearward motion of the torso may produce injury. The minimal left lateral restraint may allow the occupant to rotate out of the restraint system or just move sideways until contact with structure in that direction."

These deficiencies were pointed out to Mr. Leonard Korenek, FAA Principal Operations Inspector for Braniff Airways, in July of 1976. They have also been presented to Braniff Company officials in February of 1977. Mr. Russell Thayer, Executive Vice President, Corporate and Market Planning, responded in March

> "Until such time as the FAA advises Braniff through its appropriate channels that the fold-down jumpseat, or any other piece of equipment, does not meet the standards set forth by the applicable FAR's, we will continue to utilize them."

Recently Ms. Del Mott, Air Safety Director, AFA, again wrote the FAA Administrator and "demanded that the FAA, with the jurisdiction empowered to them, consider the safety and well-being of all occupants aboard the Braniff aircraft (or any other aircraft with identical flight attendant seat modification) by requiring an immediate ban and removal of said seats and by placing a restriction as to design, modification or approval of future seats of this nature which involve danger to the occupants."

Mr. Quentin Taylor, FAA Acting Administrator, responded in April. His reply was one of misconstrued facts and unjustifiable references to "evaluation". FAA obviously does not intend to initiate any rule-making which would remove this offending seat.

Yet another plea has been sent to Mr. Taylor, along with requests to send any paperwork confirming test evaluations done on (1) flight attendants safely reaching alternate seat for oxygen in the event of a decompression, and (2) shoulder harness attach point not being considered an injurious object to a head strike, as mentioned in his letter.

AFA POSITION:

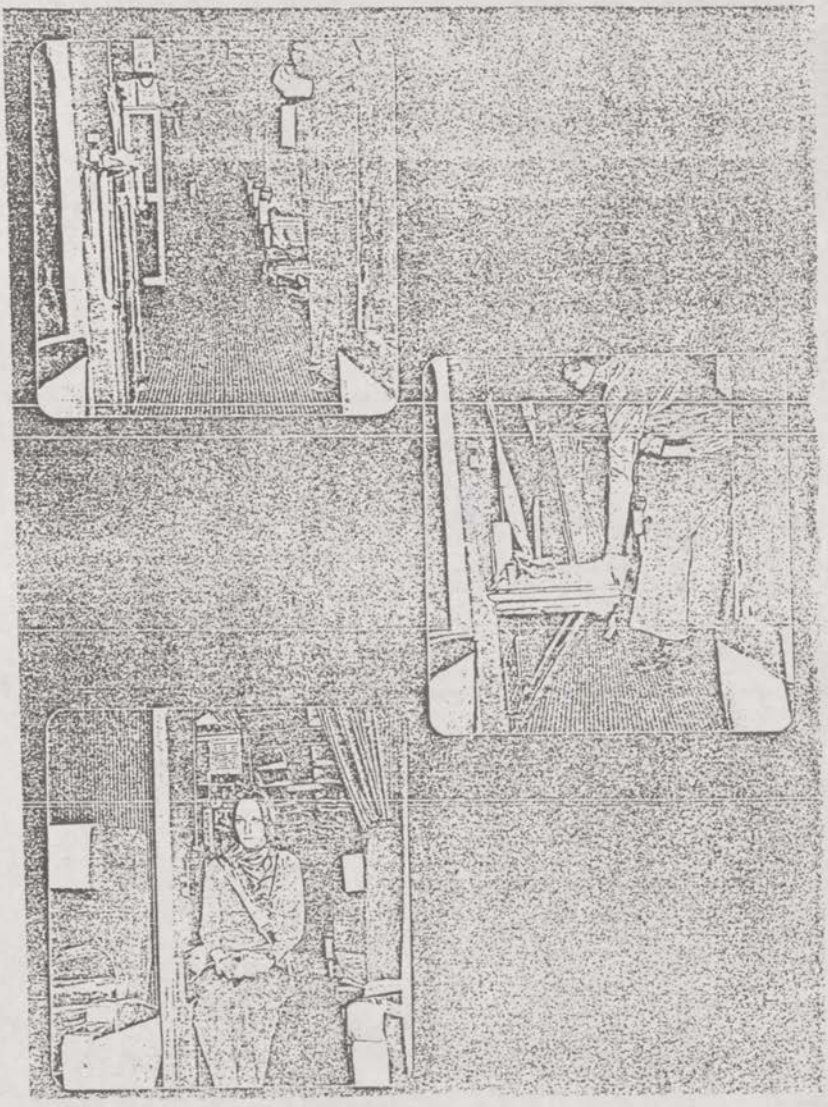
The Association of Flight Attendants, which represents the safety interests of 16,000 flight attendants and strives continually to upgrade cabin safety for all occupants, feels strongly that FAA must uphold its responsibilities to flight attendant and occupant safety aboard aircraft by eliminating this "death trap". Survivability depends on the responsible agencies within our government's taking measures to improve the chances of survival and mobility of crew members who can then evacuate passengers. If cabin crew members are killed or injured, the lives of passengers are jeopardized, if not lost. Passenger survival is predicated on crew member survival.

In survivable accidents between 1970 and 1974, 43 percent of the flight attendants were immobile during the take-off, while 48 percent were rendered unable to assist in the evacuation of passengers in the landing phase. How many of the passengers aboard these airplanes could have been saved if the cabin crew had been mobile?

As air travel becomes the preferred mode of transportation and touches the lives of a rapidly growing consumer group, concerns must become formalized into legal safeguards. "Life" and "limb" are not abstract terms on an insurance policy. They embrace the concept of life as a commodity much too precious to be left to the random whims and fancies of aircraft designs and individual airlines.

Flight attendants are relied upon for leadership, responsibility and training to assist in planned and unplanned emergencies. If they are required to utilize seats which jeopardize their lives, they are of no use to those passengers whose lives are entrusted to them. In the same respect, the FAA, who requires such training, is failing in its duties by not recognizing its gross error in approving this seat, and in its failure to remove said seat, is posing a threat to the same lives it is duty-bound to protect.

As for the airline industry, sighting economic impact as a justification for the continued use of this seat is not only unjustifiable, but unconscionable as well.



ASSOCIATION OF FLIGHT ATTENDANTS
1625 MASSACHUSETTS AVENUE, N.W., WASHINGTON, D.C. 20036, 202-797-4015

August 4, 1976

Mr. Richard Chandler
Chief, Civil Aeromedical Institute, FAA
P. O. Box 25082
Oklahoma City, Oklahoma 73125

SUBJECT: Braniff (Forward-Facing) Side Galley Seats

Dear Mr. Chandler:

During EAA's 1975 flight attendant jumpseat investigation, in which FAA determined that specific deficiencies were existant on certain types of aircraft, a proposed Airworthiness Directive was issued on August 7, 1975 to solicit comments. Aircraft listed in the proposed AD were the YS-11, B707B, 707C, 727, 727-100, 727-200, BAC-1-11-200/400, CV580, CV600, DC8-61/63. The proposed AD discussed the removal of seats mounted on cockpit doors, side-facing seats, the forward and aft BAC-111 seats and seats located in or attached to galleys on the DC-8, CV600 and YS-11. After issuance of the proposed AD and prior to the comment date, at our meeting with Mr. Collie, Chief, Air Carrier Operations Branch, FAA, September 5, 1975, we expressed our concern that the Braniff side galley (not side-facing) flight attendant seat was not included in the proposed AD. During that meeting, we were told that the language of the proposed AD could include the Braniff seat in that the AD contains the clause, "but not limited to." We were also advised to include in our comments our concerns related to the Braniff seat. Attached, please find a copy of our September 25, 1975 letter to FAA, Rule Docket No. 14912 (note page 2 concerning the Braniff side seat).

On February 23, 1976 FAA issued an Airworthiness Directive to eliminate side-facing seats ONLY. In other words, all the flight attendant seats which had been evaluated in the proposed AD were not included in this AD. It is interesting to note that, while obvious deficiencies exist in the seats listed in the proposed AD (and including the Braniff side seats), FAA simply ignored that fact and stated that the NPRM still under consideration, would cover those specific deficiencies. Following the issuance of the AD, it again became apparent that certain questions needed to be answered by FAA which involved seats other than the side-facing seats. Again, we wrote letters to FAA part of which included reference to the Braniff side seats not having access to oxygen. Copies of the following letters are enclosed:

My letter to Mr. Tibbs, FAA, dated March 9, note page 3
Mr. Kemp's (FAA) letter to me dated April 2, note #4

My letter to Mr. Tibbs, FAA, dated May 19, note page 3, #4
Mr. Robinson's (FAA) undated letter to me which we received July 21, 1976, note page 3, #4A

On July 1, 1976, Ms. Patricia Vane, Braniff, Central Safety Chairperson, wrote to Mr. Korenek; FAA, Principal Operations Inspector for Braniff, requesting the paperwork involving the original approval and certification of the side galley jumpseat on both 727-100 and 727-200. Ms. Vane clearly outlined the dangers of the aforementioned seats and asked for assistance in this matter. On July 14, 1976 Mr. Korenek wrote to Ms. Vane stating that he finds that this jumpseat "apparently" meets the requirements of Part 25. (Attached are copies of both letters for your information.)

The Association of Flight Attendants has taken the position that the seats mentioned herein are extremely dangerous to the occupants of the seats and consequently the passengers for whom the flight attendant is responsible. While the seat may meet "regulatory" standards, that in itself is no assurance that the seat is, in fact safe for occupancy. The AFA contends that this seat, in fact does not meet the requirements under which the aircraft was type certificated and we have continually urged removal and restriction of the seat due to the dangers which were reiterated in the September 25, 1975 letter, copy enclosed herein.

At this time, we once again ask that FAA review all the material, correspondence and photographs regarding this seat and we request a complete evaluation which is not limited to but should include:

(1) how it meets the requirements of FAR Part 25, including the 20 inch access requirement to major type one and two exits

(2) how it compares with the present state of the art

(3) possible injury as it relates to the occupant of this seat, and

(4) if and when this seat was used during the emergency demonstration for certification of this aircraft.

We appreciate the assistance you can provide us concerning the Braniff side galley seats.

Very truly yours,

D. R. Mott

Mrs. Del R. Mott
Director of Safety

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AERONAUTICAL CENTER
P.O. BOX 25082
OKLAHOMA CITY, OKLAHOMA 73125

August 18, 1976

Mrs. Del R. Mott
Director of Safety
Association of Flight Attendants
1625 Massachusetts Avenue, N. W.
Washington, D.C. 20036

RECEIVED
AUG 23 1976
A. F. A. AIR SAFETY

Dear Mrs. Mott:

As you know, we are not usually involved, or otherwise informed, during certification processes, so I am unable to provide authoritative answers to your questions numbered 1 and 4 relating to certification of the Braniff 727 side galley jump seat. As Mr. Korenek implied in his letter of July 14, queries regarding the certification might best be addressed to the Flight Standards Division (ANW-200), Federal Aviation Administration (FAA) Northwest Region, FAA Building, King County International Airport, Seattle, Washington 98108.

Your second question, regarding the state-of-the-art, is also difficult to answer without knowing the development background of the seat, restraint, and cabin interior system. In my opinion, the present state-of-the-art would dictate that crash protection systems be designed with adequate consideration of the dynamics of the system, the crash environment, and the occupant, and then the resulting design validated by dynamic test with measurement of injury criteria. This is commonly done with automotive and military aviation systems. If this procedure has been followed in developing the Braniff 727 seat, and if the results are favorable, it could be within the "present state-of-the-art." Please note that I have been careful to speak of the "state-of-the-art" rather than the "state-of-the-regulations." None of these procedures are required by current Federal Aviation Regulations (FAR). It is unfortunate that many manufacturers, lacking the regulatory incentive, do not expend the effort to maintain their status commensurate with the state-of-the-art elsewhere.

The possible injuries relating to the occupant of the seat, your third question, would most likely result from the low seat back and/or the relative lack of torso restraint in the left lateral direction. The low seat back could be critical if a hyperextension reaction occurred, as might exist if the torso rebounded toward the seat back due to the

elastic properties of the restraint system. Even if the seat back failed, as might be desirable in such an event, continued rearward motion of the torso may produce injury. The minimal left lateral restraint may allow the occupant to rotate out of the restraint system or just move sideways until contact with structure in that direction.

It may be of interest to you to note that the seat on the Braniff 727 is apparently identical to a seat used on Trans World Airlines (TWA) 707 charter-configuration aircraft. However, for that installation padding was provided on the bulkhead in the head contact area, over the upper anchor for the shoulder belt, and on the work area surface across the aisle. Although we have not assessed the effectiveness of the padding, it was apparently installed to reduce the potential for injury. In response to our letter of concern regarding the TWA installation, we were told by AFS-223 that the concerns relative to that configuration were identified during the May 1975 reassessment of flight attendant seating conducted by the Flight Standards Service and were addressed by Notice of Proposed Rulemaking (NPRM) 75-31.

As you requested, I am enclosing your photographs of the seat.

Sincerely,

Richard F. Chandler

RICHARD F. CHANDLER
Chief, Protection & Survival Lab., AAC-119
Civil Aeromedical Institute

Enclosure

anm-c12:8110-5

Interior arrangement diagrams approved for Braniff 727 airplanes

212

Chief, Engineering and Manufacturing Branch, AWA-210

SA-ACOO-32
Bill (Braniff)

210

For your information, Ms. Patricia S. Vane, Chairperson, Central Safety Committee (Braniff), met with us on August 25, 1976, to discuss stewardess seats mounted on galleys in the aisleways of Braniff 727 aircraft.

We reviewed all interior arrangement diagrams for Braniff 727 series aircraft presented by the Boeing Company to FAA engineering. We found that the interior arrangements on the following drawings for the Boeing 727-227 airplanes do have stewardess seats mounted on galleys in aisleways and further, that drop-out oxygen for these seats is provided:

65-62177, Sheet 1 and Sheet 2
65-79666

We further noted that the interior arrangements as shown on the following drawings for the Boeing 727-100 series aircraft delivered to Braniff have no indication whatsoever of any stewardess seats mounted on galleys in the aisleways:

65-65534, Sheet 1 and Sheet 2
65-74755
65-61545
65-64590
65-67049
65-61025

Ms. Vane's concern seemed to be that in a particular Braniff Boeing 727-100 series airplane with stewardess seats on galleys in the aisleways, there were no drop-out oxygen masks installed. Oxygen masks, of course, are required for certification per FAR 25.1447.

It appears that the interior arrangement Ms. Vane is interested in was approved by other than trained engineering personnel. Problems can occur in these cases because several FAR's are involved together with a great many policy decisions. We strongly recommend that interior arrangement modifications be coordinated with the responsible FAA engineering branch to assure compliance with the applicable FAR's.

Should you have any questions, do not hesitate to contact this office.

Original Signed By:
Charles C. Bohnsack

Charles C. SCHNSACK

ANM-c12:JHart:lf:8/26/76
File:8110-5/727

cc: Ms. Vane
AFS-120

March 3, 1977

Dr. John L. McLucas
Administrator
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

SUBJECT: Braniff Airlines 727-100 & 200 Galley Seat

Dear Dr. McLucas:

For well over a year, we have kept the Federal Aviation Administration apprised of the serious safety hazard to both the passengers and flight attendants aboard Braniff 727-100 and 727-200 series aircraft. We have consistently urged the FAA to prohibit the use of the forward-facing flight attendant jumpseats, which fold out from the side of the galley bulkhead.

It is apparent that FAA, as well, felt this seat to be unsafe as reflected by the Washington FAA Headquarter's issuance of a NOTAM to all FAA Field Offices in January 1977 restricting use of these flight attendant seats. It is indeed curious that FAA headquarters rescinded the same requirement within a week of the NOTAM's issuance.

The seat does not meet the requirements under which the aircraft was type certificated and contains obvious deficiencies as follows:

1. The 727-100 galley seat has no drop-down oxygen as required by Federal Regulations. [CAM 4b.651 (d) - FAR 25.1447 (c) (1)]

2. The seat's shoulder harness attach point protrudes from the bulkhead wall in direct line with the occupant's temple, which is a direct violation of Federal Regulations. [CAM 4b.358 (a), (b) (i) (ii) and (3) - FAR 25.785 (c) (2)]

3. The seat, while occupied (or when inoperative), blocks access to major exits which could trap passengers within the aircraft should an evacuation become necessary. [CAM 4b.362 (g) - FAR 25.813 (a)]

4. The seat has no shoulder or head supports (the back of the seat comes to below shoulder level).

5. The existing cross-type shoulder harness allows flailing of the occupant during decelerative forces as pointed out by FAA Civil Aeromedical Institute.

The flight attendant is trained and responsible to assist the passenger in the event of aircraft emergencies. However, on the Braniff aircraft, the flight attendants' ability to assist the passengers is negated by a serious deficiency in design and irresponsible approval of the side galley flight attendant jumpseat. Attached please find a copy of a letter dated February 7, 1977 which was sent to several Braniff officials from Ms. Patricia Vane, Braniff Central Safety Chairperson for the Association of Flight Attendants. This letter is self-explanatory and further illustrates the deficiencies we have pointed out.

We demand that FAA, with the jurisdiction empowered to them, consider the safety and well-being of all occupants aboard the Braniff aircraft (or any other aircraft with identical flight attendant seat modifications) by requiring an immediate ban and removal of said seats and by placing a restriction as to design, modification or approval of future seats of this nature which involve danger to the occupants.

Sincerely,

Patricia D. Robertson
President

Del R. Mott
Director of Safety

PDR:DRM/kbl

Enclosure

cc: Mike Cross, BNF Acting MECC
Patricia Vane, BNF CSC
ABC News
CBS News
Dallas Morning News
Dallas Times Herald
Fort Worth Star Telegram
NBC News

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

APR 8 1977

OFFICE OF THE ADMINISTRATOR

Ms. Patricia D. Robertson and Ms. Del R. Mott
Association of Flight Attendants
1625 Massachusetts Avenue, NW.
Washington, D.C. 20036

RECEIVED
APR 13 1977
DEPARTMENT OF TRANSPORTATION

Dear Mses. Robertson and Mott:

As indicated in your letter of March 3, the Federal Aviation Administration (FAA) is aware of your organization's position regarding the flight attendant seats which fold out from the side of the galley bulkhead installed on some B-727 aircraft. To that effect, there was correspondence issued from FAA headquarters to the various regional offices. That correspondence was rescinded shortly after issuance since it contained a misinterpretation of the applicability of Civil Aeronautics Regulation 4b.362 as stated in Advisory Circular 20-33B (copy enclosed).

In response to your numbered items:

1. The B-727-100 galley seat you mentioned is used by Braniff Airways and does not have an overhead oxygen dispensing unit. Federal Aviation Regulation 25.1447(c)(1) which you referenced requires an oxygen dispensing unit for each seated occupant if the aircraft is certificated for operations above 25,000 feet. The supplemental type certificate which approved that seat restricts its use. Specifically, each seat of that type has a placard near it which states "Hostess seat to be occupied only during takeoff and landing." If the need for oxygen arises during flight, that seat is not to be occupied.

   On the 100 series airplane, Braniff normally assigns three flight attendants. However, occasionally it is necessary to assign four flight attendants. As you know, this airplane has two flight attendant seats in the front of the airplane and two in the rear that have oxygen outlets. The reason the galley seat is used during takeoff and landing is because it is closer to the galley floor level exit than the other flight attendant seats. We might add that the only time the galley seat is used is when there is a full passenger load.

   On the 200 series airplanes, when Braniff assigns five flight attendants and they have a full passenger load, it is necessary for one flight attendant to occupy the galley seat. However, on this airplane, the galley seat is provided with an oxygen outlet.

2. During initial certification of the seat, the shoulder harness attach point protrusion was evaluated and was not considered an injurious object to a head strike.

3. The seat automatically retracts when not occupied. When retracted the seat does not block access to a major exit.

4 and 5. The seat meets present certification requirements with respect to shoulder/head supports and shoulder harnesses.

There is no statistical evidence to indicate that the seat or its installation has been the cause of injury to flight attendants. Mr. Chandler, who is quoted in Patricia Vane's letter, does not speak to the probability of injury from use of this seat but to the probable causes of injury should an injury occur. We can do this for any seat.

The opinions and proposals of you and your colleagues are always valued and this matter is being further evaluated. You can be assured that if subsequent investigation reveals a confirmed safety hazard with respect to the seat, appropriate corrective action will be taken.

Sincerely,

Quentin S. Taylor
Acting Administrator

Enclosure

AC NO: 20-33B

DATE: May 1, 1975

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: TECHNICAL INFORMATION REGARDING CIVIL AERONAUTICS MANUALS 1, 3, 4a, 4b, 5, 6, 7, 8, 9, 13, and 14

1. PURPOSE. This circular is to advise the public that such policy information as is contained in Civil Aeronautics Manuals (CAMs) 1, 3, 4a, 4b, 5, 6, 7, 9, 13, and 14, may be used in conjunction with specific sections of the Federal Aviation Regulations which correspond with the sections of the Civil Air Regulations to which the policies are applicable, upon recodification effective February 1, 1965. CAM 8 may be used in conjunction with FAR 21.25, FAR 21.185, and FAR 21.187 for restricted category certification of small agricultural airplanes only.

2. CANCELLATION. AC No. 20-33A dated 3/7/75 is cancelled. The reference to CAM 8 has been reinstated for small agricultural airplanes.

3. INFORMATION.

   a. Civil Aeronautics Manual policies provide detailed technical information on acceptable methods of complying with the regulations. Such policies are for the guidance of the public and are not mandatory.

   b. CAMs covering the certification of products should not be discarded by interested persons upon recodification, because the rules contained therein, and accompanying policies, will continue to apply to products which have been certificated thereunder.

   c. Policies applicable to sections of the Federal Aviation Regulations will be contained in the future Advisory Circular issuances, which will update and replace the CAM materials.

J. A. Ferrarese

Acting Director, Flight Standards Service

Initiated by: AFS-180

36551

ASSOCIATION OF FLIGHT ATTENDANTS
1625 MASSACHUSETTS AVENUE, N.W., WASHINGTON, D.C. 20036, 202-797-4015

June 2, 1977

Mr. Quentin S. Taylor
Deputy Administrator
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

SUBJECT: B-727 Galley Bulkhead Seat

Dear Mr. Taylor:

We have reviewed your April 8 response to our March 3 letter in which we requested that the FAA remove a dangerous flight attendant seat installation (which folds out into the aisle of the galley bulkhead) on 727-100 and 200 series aircraft.

While we appreciated your timely response, we were troubled by your explanations and feel that this hazard is serious enough to warrant reconsideration of the position taken in your April 8 letter.

In further discussion of your explanation:

1. OXYGEN AVAILABILITY: You state that since the supplemental type certificate restricts this seat for use during takeoff and landing only, the flight attendant can move to another seat should the need arise at higher altitudes. However, in examination of the supplemental type certificate we received, there is no mention of restricting the seat's use to takeoff and landing. Additionally, we feel there are many situations which could arise which would prevent the flight attendant from safely reaching another seat for oxygen (i.e. smoke and fog in the cabin and a rapid descent). AFA would like to view whatever paperwork that FAA used to justify this position and that led FAA to conclude that flight attendant safety would not be jeopardized in the event of a decompression on this aircraft.

We might add, with reference to your statement "the only time the galley seat is used is when there is a full load of passengers", that seat 7C is in fact used by Braniff passengers anytime they request it. It has always been a "courtesy" on the part of agents to block that seat. Our Braniff Central Safety Chairperson, Ms. Patricia Vane, recently

received a letter from Mr. Russell Thayer, Braniff Vice President Corporate and Market Planning, making a statement which confirms yours. However, the Braniff Flight Attendant Department and Field Services Department apparently are not aware of this, as evidenced by enclosed letter and flight attendant report.

We might also add that whether or not the flight is full should have no bearing on where a flight attendant sits. The seat is unsafe and should not be condoned by FAA and Braniff in the interest of economics.

As you mentioned, the side galley jumpseat on the 727-200 series aircraft does have oxygen above it. However, we hasten to add that it does not meet CAR 4B.358 as outlined in the enclosures to our March 3 letter.

2. ATTACH POINT PROTRUSION: AFA is interested in what criteria FAA used to determine that the attached point protrusion was not considered injurious. In careful study of CAR 4B.358, AFA does not see any exemption mentioned. We would like the opportunity to examine the paperwork involving testing done on this matter.

3. SEAT RETRACTION/ROUTE OF EGRESS: We agree with your statement that the seat is designed to retract automatically when not occupied. That it would not block access to a major exit if unoccupied is a fact. However, you neglect to take into consideration the high probability that the flight attendant would be seriously injured or incapacitated on this seat and unable to remove him/herself from the seat. (I refer to injuries such as striking of the head on the shoulder harness attach point located on the galley bulkhead, or being struck by items coming loose from the galley, or receiving injuries from crash forces as stated by Mr. Chandler.)

4. and 5. SHOULDER HARNESS AND SHOULDER/HEAD SUPPORT: The seat may meet present certification requirements with respect to shoulder harnesses and seat belts as indicated in your response; but in considering the questions of head support, may we reiterate that the seats have no padding or support for the head or spine, and they do not meet the requirements in CAR 4B.358.

Based on these concerns, we respectfully request the above-mentioned paperwork concerning testing which led FAA to take the position that 1) flight attendants can safely reach an alternate seat during a rapid decompression and that 2) flight attendants will not receive injury from striking their heads on the shoulder harness attach point.

In the interim, we would hope that FAA will reconsider its obligation to the safety of flight attendants and re-evaluate its position in approving this seat.

Sincerely,

Patricia D. Robertson
President

PDR/kbl

Enclosure

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

JUL 25 1977

OFFICE OF
THE ADMINISTRATOR

Ms. Patricia D. Robertson
President
Association of Flight Attendants
1625 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Dear Ms. Robertson:

As you may recall, one of your June 2 letters requested data concerning the B-727-100 foldout galley seats.

Enclosed please find copies of the pertinent pages from the Supplemental Type Certificate (STC) that approved the fold-out galley seat on certain Braniff B-727-100 aircraft. The required placards are depicted in Figure 1. One placard clearly restricts use of the seat to takeoff and landing. That placard is installed near all of the foldout galley seats approved in accordance with this STC.

Also enclosed is a copy of a page from the Braniff Flight Attendant's Manual which specifically prohibits flight attendants from occupying the galley foldout seat in flight.

A flight attendant attempting to reach a seat during the conditions of smoke and fog associated with a decompression as you described should have no more difficulty in reaching an assigned seat than any other occupant of the aircraft who happened to be out of a seat during the occurrence.

The Civil Aeronautics Manual (CAM) 4b, Section 358, promulgated guidelines for the installation of seats, berths and safety belts on transport category aircraft. CAM 4b.358 delineated that passengers and crewmembers be afforded protection from head injuries by one, not all, of the listed means.

The B-727-100 foldout galley seat has a seatbelt and shoulder harness which, when properly worn, protects the head from striking any injurious object when the seat and occupant are subjected to the "g" limits to which the seat was certificated. The shoulder harness attach point is behind the seat, below the head level, and was not considered injurious to a head strike during the seat certification process. This was a judgment on the part of the engineers involved in the certification. There is no testing data with that specific judgment.

Airworthiness Review Notice No. 8, dated July 11, 1975, contained provisions which propose to amend Federal Aviation Regulation 25.785, "Seats, berths, safety belts, and harnesses." The proposed amendment lists specific requirements for flight attendant seats which, if adopted, would ban the use of the B-727-100 foldout galley seat as it is presently constructed.

In summary, the Federal Aviation Administration is in the process of upgrading all cabin attendant seating requirements. The seat presently conforms to existing certification requirements. There is no accident/incident trend that would warrant an emergency revocation of the original certification, which is what would be required to take the action specified in your letter, i.e., "requiring an immediate ban and removal of said seats."

It is hoped that the above information is sufficiently responsive to your letter. As we have previously stated, should subsequent investigation reveal a confirmed safety hazard with respect to the seat, appropriate corrective action will be taken.

Sincerely,

Quentin S. Taylor
Acting Administrator

2 Enclosures

Number SA2332WE

This certificate, issued to Braniff Airways, Incorporated
P. O. Box 35001
Dallas, Texas 75235

certifies that the change in the type design for the following product with the limitations and conditions thereto as specified hereon meets the airworthiness requirements of Part 4b of the Civil Air Regulations. (See T.C. Data Sheet A3WE)

Original Product — Type Certificate Number: A3WE
Make: Boeing
Model: 727-27, 727-27C, 727-62C, 727-78, 727-162, 727-191

Description of Type Design Change: Modification of the above listed 727 Airplanes by installation of Hostess Seat P/N 6878 installed in accordance with sealed drawing BI 1-25308.

Limitations and Conditions: The approval of this change in type design applied basically to the above listed 727 Airplanes only. This approval should not be extended to other aircraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the interrelationship between this change and any of those other previously approved modifications will introduce no adverse effect upon the airworthiness of that aircraft. This determination should include consideration of significant changes in weight distribution such as an increase in the fixed disposable weight in the fuselage. This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: 26 MAR 1971
Date issued:
Date of issuance: 9 APR 1971
Date amended:

By direction of the Administrator

(Signature)

Acting Chief, Aircraft Engineering Division
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

FAA Form 8110-2(10-68)

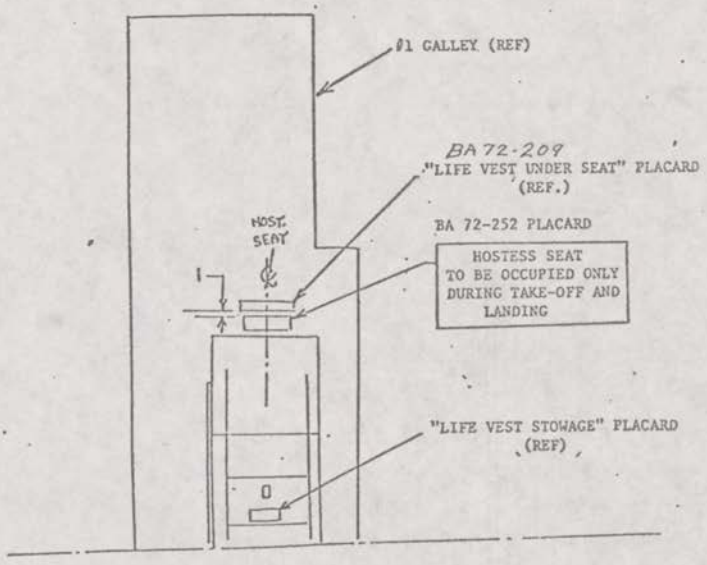
BRANIFF INTERNATIONAL		SIZE		REV
ENGINEERING DIVISION DALLAS, TEXAS		A	DWG NO. EE 1-25309 SHEET 1 OF 1	-
TOLERANCES UNLESS OTHERWISE SPECIFIED	SCALE None		Summary of Hostess Seat Installation Drawings	
DECIMAL .XX ±.03 .XXX ±.010	DATE 3-25-71			
	DRAWN CL			
FRACTIONAL ±1/32	ENGINEER F. Wisha	TITLE	USED ON 727-100 Series	
ANGULAR ±1/2°	APPROVED	SUPERSEDES	NEXT ASSY	

DOCUMENT NO.	CHANGE LETTER	TITLE
DWG. 1-20 sheets 1 & 2	C	Installation Hostess Seat 6273 for Braniff International, 727-100
EA 1-25-5775	1	Installation of Hostess Seat P/N 6875 on No. 1 Galley

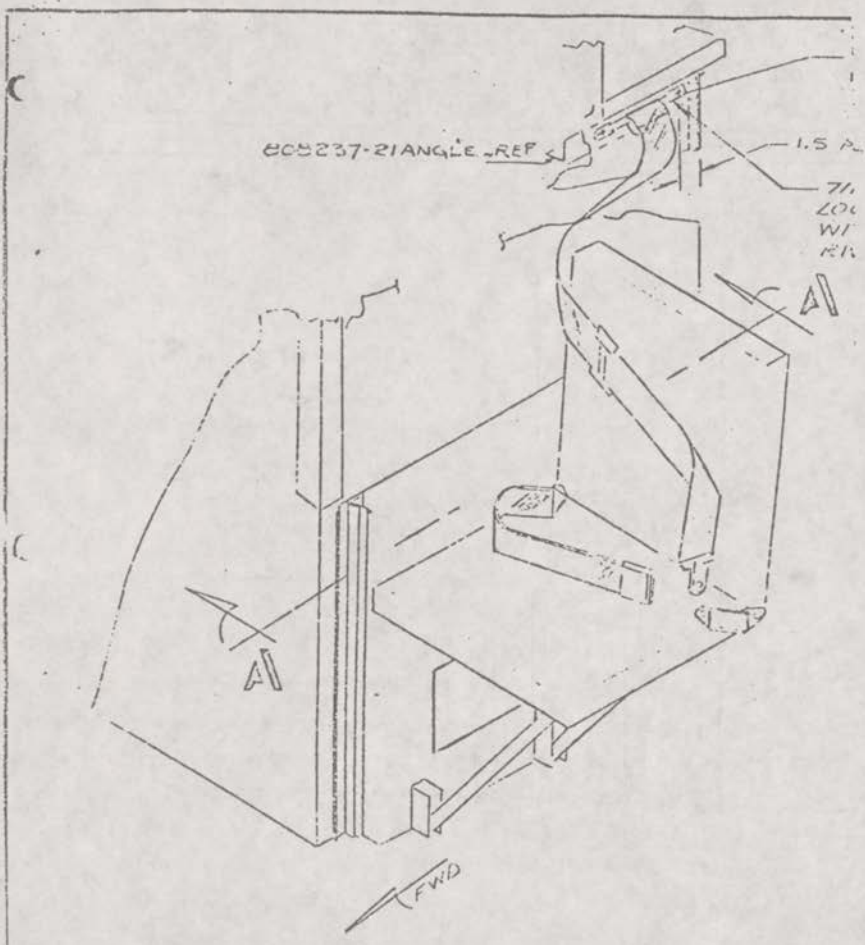
BI EA

EA NO. 1-25-577S

FIGURE 1 - HOSTESS SEAT PLACARD INSTALLATION



VIEW LOOKING OUTBOARD


ECS237-21 ANGLE - REF
A
A
FWD

Up/Down
Stop Buttons

December 27, 1973

Mr. Robert Jones
Chief, Air Carrier Operations Branch
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

Dear Mr. Jones:

Your letter of December 19, 1973 concerning the overriding capacity of the "Up" and "Down" buttons over the emergency stop button referred only to the DC-10 aircraft.

We would extremely be interested to know whether the B-747 and the L-1011 have the same characteristic. Our flight attendants have reported that the B-747 does operate in a similar fashion and it would certainly be good preventive safety to have this information verified and disseminated immediately.

Additionally, we understand rewiring of the system to allow the emergency stop button to override the "Up" and "Down" buttons under all conditions is relatively simple and inexpensive. Could you advise us if and when this will be accomplished.

Thank you for your cooperation.

Very truly yours,

Mrs. Del R. Mott
Air Safety Coordinator

DRM/kb

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20590

JAN 23 1974

RECEIVED
JAN 23 1974
S & S AIR SAFETY

Mrs. Del R. Mott
Air Safety Coordinator
Air Line Pilots Association
1625 Massachusetts Avenue, N.W.
Washington, D. C. 20036

Dear Mrs. Mott:

In your December 27 letter you requested additional information regarding the operation of the B-747 and L-1011 concerning the overriding capacity of the "Up" and "Down" buttons on the respective personnel and service lifts. We are enclosing a brief description of the electrical system relating to the B-747 and L-1011 lift operation.

The aircraft that are similar in this respect are the DC-10 and L-1011, in that they both operate in the same manner as an elevator, which do not require holding the button in to go up or down. However, internally on the L-1011 there are two switches and when personnel are transported up or down, the switch must remain in that position for the desired direction. These switches do not have priority over the control panels outside the lift. On the B-747 the button must be held in to obtain continuous movement in either direction.

There are enough differences in all three aircraft that crewmembers need to be checked out in the individual aircraft lift system to assure proper operation. In the case of crewmembers serving on more than one type, then differences training is necessary.

The B-747 does not have an emergency override button installed as an emergency stop button, and to stop the lift only requires that the button be released. In the case of the L-1011, depressing the "Stop" button stops the lift while moving in either direction.

At the present time, there are no intentions of requiring rewiring modifications to any of the presently installed lifts on the DC-10, L-1011, or B-747. The aircraft manufacturers in each instance satisfied the certification requirements of the type design and each system when operated properly meets the required safety standards.

If we can be of further help in this matter, please advise.

Sincerely,

for ROBERT E. JONES, Chief
Air Carrier Operations Branch
Flight Standards Service

Enclosure

Review of B-747 Electrical System on the Lift Elevator system.

1. B-747 for proper operation:

   (a) For "Up" movement of the lift, depress and hold-in the "Up" button. Release of the "Up" button, the upward movement stops. If the "Up" button is continously depressed, the lift will move upwards until it engages the mechanical interlock safety stop switch which shuts off the electrical power and the lift stops.

   (b) There is NO emergency override button installed as an emergency stop button. Release of the hold-in pressure on either of the buttons removes the electrical power and the lift motion will stop.

   (c) If, an "Up" button is depressed and held-in at one of the control panels and the "Down" button is simultaneously depressed and held-in on another panel, the button which makes contact first will control the direction of motion unitl it is released or the mechanical interlock stop is reached at the end of total travel of the lift; if, at that point the "Down" button is still depressed, the lift will immediately start its downward travel until the down button is released or the lower limit stop is reached. Therefore, continuously depressing and holding in both the "Up" and "Down" buttons, the lift will then travel to the limit and reverse itself in the opposite direction; this will continue until one or the other controlling buttons is released.

2. Review of the L-1011 Electrical System on the Lift Elevator system.

(a) For "Up" movement of the lift, the "Up" button is pressed and released. The lift motion starts upwards and will continue until the stop button is depressed which will stop the lift motion or the lift will continue its upward direction until it engages the mechanical interlock stop. Movement may again be started by depressing the opposite direction button. If during either direction of motion, the "Stop" button is pressed, the lift motion is stopped; lift motion may be re-started by pressing either the "Up" or "Down" buttons, then the lift will move in the direction selected.

(b) The "Stop" button on each control panel will stop the lift motion. It may be considered as the emergency stop button.

(c) Internally inside the lift cage there are two switches, that are used when personnel are transported up and dowin in the lift. These switches, (both of them) must be held in the "On" position for the direction of motion. These switches can be over-ridden by the "Stop" buttons on the control panels. Thus, in this manner, emergency stopping of the lift is provided from the control panels.

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL
STEWARD & STEWARDESS DIVISION
1625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 797-4000

March 29, 1974

The Honorable Isabel Burgess
Member of the Board
National Transportation Safety Board
800 Independence Avenue, S. W.
Washington, D. C. 20591

Re: National Airlines, DC-10 Accident
Albuquerque, New Mexico
November 3, 1973

Dear Mrs. Burgess:

In accordance with Section 431.31 of the National Transportation Safety Board Rules of Practice in Aircraft Accident Inquiries, the Steward and Stewardess Division of the Air Line Pilots Association respectfully submits the following recommendations and support as a result of the National Airlines DC-10 accident near Albuquerque, New Mexico on November 3, 1973 and the subsequent Public Hearings.

The Steward and Stewardess Division of the Air Line Pilots Association supports the National Transportation Safety Board recommendation dated February 7, 1974, page three and page four as follows: (1) Require that all operators of aircraft which contain individual chemical oxygen-generating units to inspect these installations to insure that canisters are correctly installed in the mounts and that approved packing procedures have been followed for the supply hoses and oxygen masks. (2) Issue an Airworthiness Directive to require changes in the method of mounting these oxygen-generating units to eliminiate the possibility of improper installation and inservice failures. (3) Issue a maintenance bulletin to verify operator compliance with the provision of 14 CFR 25.1557 regarding the immediate availability of portable oxygen units and the necessity of having supply hoses and masks attached to these units. (4) Issue an Airworthiness Directive to require aircraft certificated under 14 CFR 25, that each occupiable area, which is separated from others to such an extent that significantly different decompression rates can occur, is equipped with aneroid device to detect pressure losses in that area and (5) require a more accessible location for the portable oxygen units in the lower lobe galley of all DC-10 aircraft and relocate portable oxygen units in all other aircraft, where required, to insure accessibility of portable oxygen units and compliance with the FAR's.

In addition to the Air Line Pilots Association's support for the February 7, 1974 recommendations we further recommend the following:

(1) That a manual/automatic on and off emergency lighting switch be installed in the lower lobe galley and that such a switch be independant of the main cabin emergency lighting switch. On occasion a situation may arise when personnel in the main cabin would not be aware of the necessity for emergency lighting in the lower lobe. The recommended system would provide independant means of activating emergency lighting in the lower lobe galley.

(2) That there be placarding on each seat back to indicate its contents. This placarding should be in the form of international symbols, preferably, or as a written instruction to prevent time consuming efforts on the part of the passengers in attaining necessary emergency equipment, whether it be life vests, oxygen, or any other applicable emergency equipment. International symbols are mentioned in preference to written instructions due to language difficulties.

(3) That the interior of the passenger oxygen compartments be placarded so as to indicate the heat factor and thus allowing sufficient caution to the user. Oxygen canisters and the heat shield associated with the operation of the unit transmits a high degree of heat which should not be touched or tampered with in any way, however, the individual passenger would have no knowledge of this fact unless directly exposed to it and for this reason should be warned accordingly. Preferences directed to international symbols rather than written instructions due to language difficulties.

(4) That the Federal Aviation Administration initiate a review and report to the National Transportation Safety Board the brace positions applicable to various types of aircraft seating arrangements, (seat pitch) and positioning of oxygen compartment doors to implement the safest methods; thereby, providing the best protection to the occupant. Certain aircraft allow a lesser seating pitch than others; certain brace positions will allow exposure to emergency oxygen canister heat (to include heat shields) which will cause apprehension after the assumption of the brace position; and some brace positions can conceivably cause injury to the occupant due to the position of the doors which open during actuation of the emergency oxygen system.

(5) That an oxygen flow indicator be required on the tubing connected to each mask. It is difficult for an individual to determine whether flow exits while using the masks. This would provide an easy reference to the passenger or flight attendant to determine that necessary oxygen flow has started.

(6) That the passenger and crewmember oxygen masks conform to the individual facial contours to avoid leakage. Masks approved for use on the National DC-10 involved in this accident are of the design that do not always provide the capabilities of conforming to various facial contours, thereby causing leakage of oxygen provided to the individual. This specific mask contains no edge or "lip" as is found on all other approved oxygen masks for use by commerical aviation.

(7) That specific and complete training be provided to all crewmembers relative to the operation and use of passenger oxygen systems. Odors, heat factors, retention of heat shields, oxygen canister retentions, access to oxygen systems, and operation of oxygen units are of vital importance to all crewmembers in order to provide capable assistance and leadership necessitated by emergency situations.

(8) That the red manual inflation handle on the slide/raft be relocated so as to provide immediate visual contact. When the slide is deployed from the pack and has not inflated (hanging over the door sill), the manual inflation handle is not visible to the flight attendant or passenger unless the individual leans out over the sill.

(9) That an automatic decompression announcement be provided for use upon release of emergency oxygen system which would have the capability of being overridden by the cockpit or cabin P.A. system, if necessary. Announcement should state the type of emergency providing instructions as to the immediate use of the oxygen system (the mask locations and instructions as to their proper use, release of green safety cord, use of oxygen mask strap, etc.). This would provide immediate instructions, thereby eliminating the necessity of individual and time consuming efforts if flight attendants are unable to get to the P.A. system, or in the event the flight attendants are unable to provide assistance. Additionally, this would allow flight attendants to concentrate on emergency procedures for themselves (i.e., during decompression, the flight attendant too, must utilize oxygen immediately and stay seated until the aircraft levels off or until otherwise advised by the Captain. Flight attendants will then secure portable oxygen and assist passengers.).

(10) That the passenger and flight attendant masks be permanently attached to the rebreather bag in preference to the removable plastic fitting as seen on the National aircraft. The rebreather bag did detach easily from the mask fitting in the National decompression and the possibility of reoccurance gives reason to require permanent attachments. The plastic removable fitting is the first seen for passenger oxygen use by commerical aircraft and is not felt to be satisfactory.

(11) That emergency systems (i.e., lights, oxygen, P.A., interphones) be associated with an emergency bus. Emergency situations require use of emergency systems which are now electrically associated with non essential buses. Lights, oxygen, P.A. and interphones are of no use in rendering assistance to the passengers in critical situations unless they are capable of being powered by an emergency source.

(12) That a separate emergency power source be installed to allow temporary power for emergency operation of the lift (s). It was necessary to remove a flight attendant from the lower galley of the National DC-10 and although the electrical power source was available at the time, the possibility exists that electrical power may not be available and the necessity to remove an injured flight attendant may become eminent. Without electrical power, removal of injured flight attendants would be virtually impossible.

(13) That the entire oxygen system be capable of being automatically powered directly from an emergency bus while retaining the manual/automatic electrical redundancy now present in the system, and incorporating a basic manual backup. Passengers should have the assurance that there is the capability for automatic presentation of oxygen in the event of a pressurization loss and/or partial electrical failure.

Very truly yours,

Del Mott

Mrs. Del R. Mott
Air Safety Coordinator

DRM/kb

cc: John H. Reed, Chairman of the Board
Louis M. Thayer, Member of the Board
William R. Haley, Member of the Board
Francis H. McAdams, Member of the Board

bcc: Kelly Rueck, Vice-President
Mary Anne Baker, National, Central Safety Chairman
Mya Shelton, Chairman, New Aircraft Evaluation Committee
All Central Safety Chairmen
T. F. Bailey, National, Pilot, Central Safety Chairman
Joe Meek, Chairman, Airworthiness & Performance Committee
Chuck Miller, Director, Bureau of Aviation Safety, NTSB
Gerrit J. Wolhout, Bureau of Aviation Safety, NTSB
James F. Rudolph, Director, Flight Standards Service, FAA
John O'Brien, ALPA, Engineering and Air Safety Department

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL
STEWARD & STEWARDESS DIVISION
1625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 797-4000

May 20, 1974

Mr. James F. Rudolph, AFS-1
Director, Flight Standards Service
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

SUBJECT: DC-10 and B-747 "Up", "Down", and "Stop" buttons on galley lifts.
My December 27, 1973 letter and FAA January 22, 1974 letter.

Dear Mr. Rudolph:

After reviewing Mr. Jones' January 22, 1974 letter, National Airlines August 8, 1973 cart lift accident report, National Airlines DC-10 Albuquerque November 3, 1973 Accident Report and subsequent hearing notes, I would like a review of the answer and reasoning behind FAA's January 22, 1974 letter.

As evidenced in the January 22nd correspondence to me and brief description of the L-1011 and B-747 "Up" and "Down" button systems, Lockheed installed an emergency stop button for the specific purpose of stopping the lifts at any position. We are at a loss to understand why the same emergency system is not evident on the B-747 and DC-10.

Referring to Mr. Maxwell's (FAA Western Region) testimony at the National DC-10 (Albuquerque, November 3, 1973) hearing in February 1974, the question was asked of him as to the certification of the lifts. Mr. Maxwell stated that these lifts are certificated "only as part of the aircraft", that they must meet the load requirements for the structure of the aircraft AND they must meet "requirements for inadvertent operation".

An "Up" and "Down" button system capable of overriding a "Stop" system can obviously cause "inadvertent operation" due to the very nature of the system itself. Design and/or installation of the wiring system associated with the emergency stop system must be such that it can serve the purpose for which it was intended. Present aircraft must reflect this change to provide maximum protection to the operators or persons in the direct vicinity of these lifts to avoid injury to personnel. No stop button should be designed or installed that does not have the full capability of stopping a lift and a stop system is of ultimate importance to protect personnel in these areas.

We are not satisfied that this system meets the certification requirements because personnel using the lifts are subjected to serious injury and perhaps even death. The necessity to stop a lift was evidenced in the injury to Miss Connie Wargo, National Airlines DC-10 cart lift accident, August 9, 1973. One such example which brought this deficiency to the attention of the FAA, the airlines and the manufacturers should warrant a more thorough analysis than simply training flight attendants the differences in the lifts or that the lifts will or will not stop in an emergency situation. The point is that a "Stop" or "Emergency Stop" system must override the "Up" and "Down" characteristics of these lifts on all aircraft when there is any possibility of injury to personnel.

This is an important safety consideration which necessitates your attention and review.

Very truly yours,

Del R. Mott

Mrs. Del R. Mott
Air Safety Coordinator

DRM/kb

cc: All Central Safety Chairmen
Chairman Reed, National Transportation Safety Board

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

JUL 8 1974

RECEIVED
JUL 09 1974
S & S AIR SAFETY

Mrs. Del R. Mott
Air Safety Coordinator
Association of Flight Attendants
1625 Massachusetts Avenue, N. W.
Washington D. C. 20036

Dear Mrs. Mott:

In your May 20 letter you requested that we reconsider our position regarding the operation of B-747 and DC-10 "Up", "Down" and "Stop" buttons on the respective galley lifts.

As you may or may not be aware, this matter will be considered in the forth coming annual Air Worthiness Review. In fact, the submission on this item was made by your organization; consequently, it will be considered exactly as you have recommended.

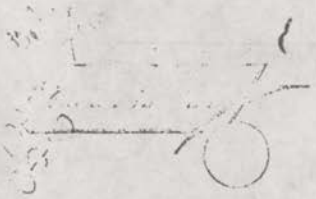
In the meantime, we are looking further into the matter by discussing the recommendation with the aircraft manufacturers, and responsible FAA field offices to determine the impact of incorporating a switch or some other device.

As soon as we have further information, we will forward our determination.

Sincerely,

Fred A. Eide

FRED A. EIDE, Chief
Training and Technical Standards
Flight Standards Service



...ward and Stewardess ...
SEATTLE JOINT COUNCIL OFFICE
EVERGREEN BUILDING
15 SOUTH GRADY WAY
RENTON, WASHINGTON 98055
(206) BA 8-4810

AFFILIATED WITH AFL-CIO

325 Ridgeview Drive
Apt. # 129
Kent, Washington 98031
November 1, 1974

Mr. D. C. Reynolds, Chairman
Douglas Flight Operations Evaluation Board
Federal Aviation Administration
Flight Standards Service
P. O. Box 92007
Worldway Postal Center
Los Angeles, California 90009

RECEIVED
NOV 04 1974
S & S AIR SAFETY

Dear Mr. Reynolds:

This letter is in reference to the wording "EMERGENCY STOP" used on the button associated with operation of the DC-10 lift doors.

This wording is most misleading, especially to flight attendants to must use the button. As you are probably aware, this is NOT an emergency stop button, merely a stop button. The wiring is such that, even though the button is depressed or held in, (activated) depressing either the up or down button for either lift will activate the lift, thus overriding the stop function.

We have already had one very serious injury, partially due to failure of this button to do what it is placarded to do. You will recall the National Airlines flight attendant who was injured in a cart lift. Please also note that someone, either the flight attendant involved, or another flight attendant, tried to stop the lift from coming further up by depressing the "emergency stop" button. However, the galley girl had her finger on the "up" button for the cart lift, causing an override to the "emergency stop" button.

We have repeatedly pointed this serious discrepancy out to the FAA and to individual airlines in an effort to have the word "EMERGENCY" removed from the control panels. We have also asked that the airlines incorporate into their training and manuals for flight attendants the specifics on how this button operates and what its function is. To date, some airline have procedures, some do not. No airline has voluntarily removed the word "emergency" from the control panels, nor has the FAA taken action. That action has not been taken by anyone is hard to comprehend, as the cost factor is so minimal.

Therefore, in order to prevent another serious injury, and in order to avoid future misunderstanding, the Association of Flight Attendants, Air Line Pilots Association,

requests that the Douglas Flight Operations Evaluation Board take action to see that the word "EMERGENCY" is deleted from the control panels, and further, that the Board take action to insure that all flight attendants who fly for airlines operating DC-10's with lower lobe galleys receive specific instruction on the use and relationship of these buttons, and that such instruction is incorporated into written material to be retained by the flight attendant.

Thank you for your attention, and I would appreciate hearing from you at your earliest convenience.

Sincerely,

Myra C. Shelton

Myra C. Shelton, Chairman
New Aircraft Evaluation Committee
Association of Flight Attendants
Air Line Pilots Association

cc: Del Mott, Director of Safety
Association of Flight Attendants
Air Line Pilots Association

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL
STEWARD & STEWARDESS DIVISION
1625 MASSACHUSETTS AVENUE, N.W. ☐ WASHINGTON, D.C. 20036 ☐ (202) 797-4000

SUBJECT: Lower lobe galleys: General (1) Aneroid systems, (2) Emergency lighting, (3) Emergency stop buttons, (4) Emergency power to lifts, (5) Flight attendant jumpseats, (6) P.A. systems, (7) Soundproofing, (8) Manual egress from lifts, (9) window or relation to surrounding environment, (10) Manual escape system (other than manual egress from lifts), (11) Lift design.

Revise Federal Regulations under Part 25 to include design requirements applicable to each of the listed subjects above. Amendments for improvements or additions (to subjects) listed should provide requirements for protection to occupants of lower lobe areas which is comparable or better than those applicable to other areas of the aircraft.

PROPOSAL/OBJECTIVE: Amend Federal Regulations under Part 25 to insure all areas of the aircraft occupied during taxi, take off, inflight, and landing provide maximum protection to the occupants of that area.

Proposed wording:

Proposed wording contained with our April 12, 1974 letter and enclosures, for Amending Parts 25 of the Federal Regulations should be applicable to certain subjects listed above. In the event a particular subject or subjects are not presently included in the Federal Regulations, new Regulations must be established. Additional proposed wording cannot be submitted with this document due to time limitations. The justification to this proposal will include explanation for the need for such additional coverage. Reference should be made to June 6, 1973 letter to George Moore enclosed herein.

JUSTIFICATION: Although the lower lobe area is not and should not be utilized for taxi, take off and landing, eminent dangers exist and necessitate regulations accordingly in order to provide maximum protection to any occupant during flight, take off, and landing.

(1) Aneroid systems. Aneroid systems located in the main cabin of aircraft will not provide protection to the occupants of the lower galley equal to the protection provided to the occupants on the main cabin. Aneroid systems must be installed in all occupiable compartments within the aircraft in order to provide protection to occupants of that area. Refer to the attached letter sent to Mrs. Burgess, member, NTSB, March 29, 1974, regarding recommendations on this specific subject.

(2) Emergency lighting. Emergency lighting must be provided in all occupiable areas of an aircraft and have a manual/automatic on and off emergency lighting switch in that specific area. On occasions, a situation may arise when personnel in the main cabin would not be aware of the necessity for emergency lighting in the lower lobe. The recommended system would provide independent means of activating emergency lighting in the lower lobe galley. Refer to attached Recommendations sent to Mrs. Isabel Burgess, member, NTSB, March 29, 1974, concerning this specific subject.

(3) Emergency stop buttons (for lifts) in lower galley and main deck. Buttons are located in both the lower lobe galley and the main deck (service centers) which indicate an "Up", "Down" and "Emergency stop" or "Stop". The "Emergency stop" or "Stop" buttons will not halt or slow down a lift in the event the "Up" or "Down" buttons are uninterruptedly depressed. In other words the "Up" and "Down" controls can override the "Emergency stop" buttons, thereby negating use of an emergency system which must be available. Design and/or installation of the wiring system associated with the emergency stop system must be such that it can serve the purpose for which it was intended. Present aircraft must reflect this change to provide maximum protection to the operators or persons in the direct vicinity of these lifts to avoid injury to personnel. No stop button should be designed or installed that does not have the full capability of stopping a lift and a stop system is of ultimate importance to protect personnel in these areas.

(4) Emergency power to lifts. A separate emergency power source must be installed to allow temporary power for emergency operations of lift(s). It was necessary to remove a flight attendant from the lower galley of the National DC-10 and although an electrical power source was available at that time, the possibility exists that electrical power may not be available and the necessity to remove an injured flight attendant or other personnel may become eminent. Without electrical power, removal of injured personnel from this area would be virtually impossible. Refer to attached Recommendations sent to Mrs. Burgess, member, NTSB, March 29, 1974, concerning this specific subject.

(5) Flight attendant jumpseats. Flight attendants must occupy the jumpseats in the lower lobe galleys during turbulence, emergency descents and other emergency situations. Regulations applicable to all other seats must also apply to these seats to prevent injury to the occupants. Refer to our Proposals to Amend Parts 25 of the Federal Regulations concerning Flight Attendant Jumpseats (all requests for amendment are applicable to lower lobe jumpseats).

(6) P.A. systems. P.A. systems, interphones, oxygen and lights must be associated with an emergency buss. Emergency situations require use of emergency systems which are now electrically associated with non essential busses. Lights, P.A., oxygen and interphones are of no use in rendering assistance to the passengers or occupants of lower lobe areas in critical situations unless they are capable of being powered by an emergency source. Refer to the attached letter sent to Mrs. Burgess, member, NTSB, March 29, 1974, regarding recommendations on this specific subject.

(7) Soundproofing. Flight attendants cannot hear each other, they cannot hear requests from the upper deck areas via phone communications, nor can they hear shouts from above (through open escape hatch) because of lack of soundproofing in lower lobe galleys. This additionally presents a subsequent health hazard. It is recommended that soundproofing be provided for all lower galley areas which will be equal to or better than that provided for in the passenger cabin.

(8) Manual egress from all lifts. It is necessary to provide an egress system from both lifts in the event escape is necessary. Most current aircraft with lifts only provide escape from the cart lift and the lift which is designed to be utilized by personnel has no means designed to provide escape by such personnel.

36-953 O - 79 - 17

(9) Window or relation to surrounding environment. Lower lobe galleys or any compartment without means to provide relation to surrounding exterior environment must be provided with a window or television monitoring system capable of providing such. In order to provide proper explanation regarding this subject, refer to attached letters from Dr. Smith and Dr. Mason concerning the need for a relation to surrounding environment.

(10) Manual escape system (other than the egress system from lifts). There must be some means of escape from the lower galley besides the lifts. This escape means shall be required by Federal Regulations. Design and location must be of the utmost concern in order to provide positive means of escape for the occupants of this area; and to provide assistance to the occupants of the lower lobe by those on the upper deck. Such escape system shall not require multiple steps in order to utilize and it shall be located so as to be free and clear of all emergency equipment, galley components and counter space. Present manual escape systems are not acceptable in that they (1) are obstruced by galleys, (2) do not have enough emergency lighting surrounding the escape area, (3) are not easily operated due to the location of the hatch (opens into the main deck in the center aisle of the aircraft), (4) DC-10 Convertible Freighter requires removal of a ladder and replacement onto the escape hatch area before the escape system can be utilized. Serious consideration must be devoted to the design and requirements covering this subject. Refer to the attached report concerning the need for a manual egress system other than the lift escape route. (ONA DC-10 CF report.)

(11) Lift design. Design of lifts, lift components, motors associated with lifts, and emergency escape from this area are of serious concern to the occupants who must contend with improper operation and potential dangers associated with the present lifts. In order to determine the safest criteria for design and operation of both cart and personnel lifts, it is requested that an independent engineering and design study be conducted at the earliest possible date. This study should provide acceptable design operation criteria -- which when critiqued by qualified users -- should be implemented into Regulations at once. Present and future aircraft must reflect any changes recommended in order to provide maximum protection to operators or persons in the direct vicinity of these lifts to avoid further injuries to personnel.

February 25, 1976

Miss Mya Shelton, Chairperson
Aircraft Technical Committee
417 S. 208th Street
Seattle, WA 98148

Subject: Lower Lobe Galley -- Lift

Dear Mya:

Attached please find a November 3, 1975 letter from James L. Menard to me in which he encloses service bulletin 25-214 (issued by Douglas Aircraft Company) which deals with the lift in the lower lobe galley. You and I have discussed this before and, as you know, I do not feel that the action prescribed in the service bulletin will remedy the situation.

Can you please generate some correspondence to FAA and voice our objection to their solution to this serious problem.

Thanks again, Mya.

Very truly yours,

Mrs. Del R. Mott
Director of Safety

DRM/kbl

Enclosure

cc: Linda Polk, NAL CSC

DONNELL DOUGLAS CORPORATION
3855 Lakewood Boulevard
Long Beach, California 90801

DC-10 SERVICE BULLETIN

BULLETIN 25-214

EQUIPMENT/FURNISHINGS - Buffet/Galley - Cover Word EMERGENCY Engraved On Galley And Service Center Lift Control Post Assemblies With Decal Having The Word STOP.

NOTE

This Service Bulletin is applicable only to aircraft equipped with lower galleys.

Effectivity:

All delivered Models DC-10, Series 10 and 30 aircraft applicable only to Fuselage No. 1, 3 thru 28, 30 thru 86, and 88 thru 218.

Reason:

Analysis at DAC revealed the EMERGENCY terminology on the service center and lower galley lift stop switch placards is unsatisfactory. This condition exists due to the ability of the lift UP or DOWN switches to override the EMERGENCY stop switches. The word EMERGENCY is used to denote absolute priority over any normal operational modes. Present configuration permits the UP or DOWN operating switches to override the EMERGENCY switches, thereby invalidating the emergency mode. Installation of a STOP placard over the word EMERGENCY will provide the proper switch terminology and indicate the true function of the switches.

Description:

This Service Bulletin covers the engraved word EMERGENCY on the galley and service center lift control post assemblies with decals incorporating the word STOP.

Compliance:

It is recommended this modification be accomplished at the first convenient check period after fabrication of parts, but not to exceed 12 months from issue date of this Service Bulletin.

Approval:

This Service Bulletin is FAA approved.

Weight and Balance:

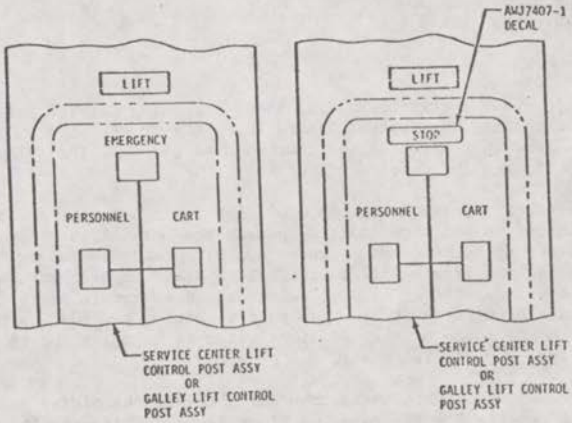
This modification will not affect aircraft weight and balance.

References:

Drawing AWJ7101 "G" change, drawing AWJ7102 "J" change, and drawing AWJ7407 "A" change.

ccomplishment Instructions:

A. Fabricate two decals as shown, letters to be black on aluminum background.



BEFORE MODIFICATION AFTER MODIFICATION

B. Identify each decal as AWJ7407-1 per operator's shop practice.

C. Install AWJ7407-1 decals over engraved word EMERGENCY on service center lift control post assembly and galley lift control post assembly per operator's shop practice.

D. Reidentify applicable lift control post assemblies per operator's shop practice as follows:

Old Part No.	Key Word	New Part No.
AWJ7101-1 or AWJ7101-501	Service Center Lift Control Post Assy	AWJ7101-503 or AWJ7101-505
AWJ7102-1 or AWJ7102-501	Galley Lift Control Post Assy	AWJ7102-503 or AWJ7102-505

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WESTERN REGION
P. O. BOX 92007, WORLDWAY POSTAL CENTER
LOS ANGELES, CALIFORNIA 90009

June 8, 1976

Ms. Mya C. Shelton, Chairman
Aircraft Technical Committee
The Association of Flight Attendants
417 South 208th
Seattle, Washington 98148

Dear Mya:

In reference to your letter of May 13, 1976, regarding Service Bulletin 25-214, which changes the switch placard EMERGENCY to the word STOP on the DC-10 galley and service center lift control panels. The following comments are offered for consideration.

As I understand the system, when the STOP light switch is pushed, a red light illuminates on all three control panels and both lifts stop; however, the lifts may be returned to operation by pushing the up or down switches and the red lights will go out. It appears to me that the STOP switch overrides the up or down switches and therefore may be considered as a priority switch. Also good operating procedure would be to investigate the cause of the red light prior to engaging the up or down switch from any control panel.

A second safeguard provides door mechanical locks in the closed position when the lift departs for the opposite floor level. This prevents opening of the door by the outside latch and, third, the lifts will not operate with either lift door open.

I agree the cart lift has an override switch on the lower galley control panel and when pushed simultaneously with a lift directional control switch, it will by-pass some of the safeguards. This override switch is used when a malfunction has occurred in the door interlock system. Therefore, I consider this an abnormal procedure and the lift operator should exercise extreme caution.

It is my understanding--after discussion with our Aircraft Engineering Division, Systems and Equipment Branch--that the FAA and/or Douglas Aircraft Company do not plan any further service bulletins or action on this system at this time.

In summary, from the operation standpoint, I believe there are adequate safeguards which permit the safe operation of the personnel and cart lifts in the normal and abnormal modes by trained personnel; however, if

you believe that there is a need for a design change, I recommend that you direct your concerns to the FAA, Western Region, Aircraft Engineering Division, AWE-100.

If I may be of further assistance, please do not hesitate to call.

Sincerely,

James L Menard

JAMES L. MENARD
Chairman, DC-10 Flight Operations Evaluation Board

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WESTERN REGION
P. O. BOX 92007, WORLDWAY POSTAL CENTER
LOS ANGELES, CALIFORNIA 90009

July 5, 1977

Ms. Mya C. Shelton
Chairman, ALPA S/S Division
Air Line Pilots Association
417 South 208th
Seattle, Washington 98148

Dear Ms. Shelton:

Sorry I didn't get a chance to talk to you more at the FOEB meeting. I appreciate your concern on the subject of operating the galley lifts with inoperative electrical interlock switches using over-ride switches. As you are well aware, we did approve such operation on the B-747 about seven years ago. If that was a mistake it is not too late to make a change and at the same time not approve the same type of operation for other airplanes.

We have contacted the Associations representing American Airlines' flight attendants for their position together with substantiating data.

If you can provide additional substantiating data to support removal of the over-ride switches, it will be useful in making our final decision on this item.

Sincerely,

S. P. NUCCI
Air Carrier Operations Specialist

ASSOCIATION OF FLIGHT ATTENDANTS
1625 MASSACHUSETTS AVENUE, N.W., WASHINGTON, D.C. 20036, 202-797-4015

July 25, 1977

TO: Mr. S. P. Nucci, Air Carrier Operations Specialist, FAA
Mr. Leon Whallon, Chairman, Douglas FOEB, FAA
Mr. Robert LeSuer, Chief, Aircraft Evaluation Group, FAA

FROM: Mya Shelton, Chairman, Aircraft Technical Committee

SUBJECT: Operation of lifts with override buttons

Gentlemen:

As discussed with you on the phone Friday, July 22, 1977, copies of reports that I have of failure to lift interlocks will have to wait until I get my files unpacked, which should be during the first week of August. As mentioned, these reports go back to the period when the DC-10 was first introduced commercially, and continue through today, indicating to me that the system was inadequate to begin with, and has not been improved through service.

Copies of those reports will be sent to you as soon as they are unpacked, so in the meantime, I hope that you can accept the general concepts put forth in this memo as additional substantiating data to supplement the reports. Also, I hope that you will keep in mind that what copies I do send to you are only "the tip of the iceberg". In other words, we do not receive in total what a given airline receives in the way of paperwork, so what you get will certainly not be all-inclusive.

I feel that we should go back to the National Airlines DC-10 incident, in which a flight attendant was seriously injured due to the non-performance of the override button. As you may recall, the galley flight attendant was holding the "up" button in--when the "Emergency Stop" button on the main deck was pushed, nothing happened, due to the fact that the then labeled "Emergency Stop" does not override the normal system, the normal system cannot be overridden if the buttons which operate it are continuously depressed in another location. The Association of Flight Attendants received full and complete reports of the incident from several sources, as at that time the Association represented the National Airlines flight attendants. No mention was made in those reports of the interlock system also being overridden. Mention was made of this, however, at the Douglas MMEL meeting in June. If this is so, that is, if the interlock system was overriden (thus rendering it "inoperative" in the sense that the interlocks were not working) and if the override button was used, and since a serious injury did occur, is it not logical that a similar incident will occur again?

Inoperative interlocks do not necessarily mean that a lift must be operated with the override button. The lifts will, in many cases, still operate with the normal system, even though one, or perhaps both, of the interlock systems is inoperative. They may not be designed to operate this way, and on paper, it is possible that it is shown that they cannot operate this way, that the only way they can operate

is with the use of the override button, but gentlemen, I am a line flight attendant, qualified on the DC-10 and have flown it. I know what happens on the airplane, not what is supposed to happen on paper. In many instances, I can, and have had someone open the lift door in the lower galley, pushed the "up" button on the main deck and had the lift operate to the up position. A basic inadequacy of the design of the system. Why then do we need to operate with the override button specifically?

Further, the temptation to hold the buttons in is tremendous. We receive many directives from our carriers, from the FAA, about what we should be doing in a given situation, which are supposed to preclude anything serious happening. But when you are out on that airplane working at top speed, those directives do not always come back to you. There are too many things to do to always have the "does and don'ts" at the front of the mind. I do not feel that the operators or the FAA have discharged their responsibilities to a safety situation by simply issuing a directive. The human element, human error and human workload must also be analysed before a decision is made.

Flight attendants are not electricians nor are they mechanics. They can be told to do something in a certain way, but if they do not understand the logic (or in this case the mechanics of a system) they may feel that what they have been told to do can be done in another way. One thing the operators stress is inventiveness on the part of the flight attendant in all situations, the ability to adapt and make do if a situation is less than ideal--and invent, adapt and make do are what flight attendants do! The particular proposal involved sets forth various conditions that must be met in the MEL. What the flight attendant will see is not what the MEL says, but something that is extracted to be put in the flight attendant manual. Such as, "If lift operates normally when either door is open, lift cannot be used." Now, what does this say? Nothing really. So the lift operates with the door open--so what? It operates, doesn't it? There is a service to be done and the lift is needed to do the service, so the "make do" conditions come into play.

Who determines what interlock system is inoperative? The mechanics? Certainly not the flight attendants, most don't know what interlocks are. Read over the reports that you will receive and see if the mechanics are doing the job on determining inoperative interlocks!

I mentioned service above. Historically, the FAA has been loathe to get involved in any area relating to safety that has to do with service. We have pleaded with the FAA for many years to investigate areas such as excessive services for the flight time involved, and the FAA remains adamant that they will not get involved. And yet, gentlemen, the FAA is being involved, through the MMEL's and the inoperative lift conditions. A lift is not a safety of flight item, (airworthiness), it is not even a crashworthy item, it is a service item. Can the aircraft fly without the lift? Yes. Can the airplane carry a full load of passengers without the lift? Yes. Can a normal in-flight meal service be accomplished without the lift? No. Can a limited in-flight meal service be accomplished without the lift? Yes. (Due to the use of main deck tie-downs approved for takeoff and landing.) And this is the crux of the matter. Without the lift inoperative condition on the MEL, the airplane can be flown in revenue service to a place for repairs. With the lift inoperative condition on the MEL the airplane can be flown in revenue service with no restrictions, period. Not being a safety of flight item, or a crashworthy item, it is deferrable, and deferred the lifts are. The system is so inadequate to begin with, that it is easier, and more profitable to operate with it inoperative.

The operators are thus able to conduct a "normal" flight without the equipment needed to conduct such a flight, and the burden of responsibility to comply in a safe manner, under a highly increased workload is placed on the flight attendant. The flight attendant is the "bandaid." Flight attendants are bandaids in so many areas (P. A. systems, interphone systems, seat belt/no smoking signs, monitoring blue rooms sinks for overflow, etc.) that one day the bandaid is going to slip. I submit that we should be finding cures for these sores, instead of using bandaids.

One further thought. What I know about MEL's I learned from FAA people. It is my understanding that a MEL is designed primarily for the occasional inoperative condition, in order to get an airplane back to a place where it can be fixed. I still hear this frequently at MMEL meetings. It is also my understanding that the MMEL is not designed to cover systems that were inadequate to begin with. Why then, was this item submitted as a change to the list?

Gentlemen, I do thank you for the opportunity to comment.

Sincerely,

cc: R. A. Davenport, Boeing FOEB Chairman, FAA
Gerritt Walhout, Chief, Human Factors Branch, NTSB
Del Mott, Director of Safety, AFA

[Whereupon, the subcommittee recessed, to reconvene at 2:30 p.m., the same day.]

AFTERNOON SESSION

Mr. BURTON. The subcommittee will come back to order.

Our next panel of witnesses will include Mr. Karl G. Harr, Jr., president, Aerospace Industries Association of America. He is accompanied by Mr. Taylor, Mr. Rowe, Mr. Frisbee, Mr. Dubil, and Mr. Slaiby.

You may proceed, Mr. Harr.

STATEMENT OF KARL G. HARR, JR., PRESIDENT, AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.; ACCOMPANIED BY RICHARD W. TAYLOR, BOEING CO.; BRIAN ROWE, GENERAL ELECTRIC CO.; LLOYD E. FRISBEE, LOCKHEED-CALIFORNIA CO.; EUGENE F. DUBIL, MCDONNELL-DOUGLAS CORP.; AND THEODORE G. SLAIBY, PRATT & WHITNEY AIRCRAFT GROUP, UNITED TECHNOLOGIES CORP.

Mr. HARR. Mr. Chairman, I know you have urged the witnesses to summarize their statements in the interest of getting to your questions, but my statement is so short that I might go through it.

Mr. BURTON. Please proceed.

Mr. HARR. I am Karl G. Harr, Jr., president of the Aerospace Industries Association of America, Inc., the national trade association representing the major manufacturers of aircraft, aircraft engines and related components and supporting equipment.

With me here today are Richard W. Taylor, vice president and special assistant to the president of the Boeing Co.; Brian Rowe, vice president and general manager, aircraft engine engineering division, the General Electric Co.; Lloyd E. Frisbee, vice president and general manager, engineering and operations, Lockheed-California Co.; Eugene F. Dubil, vice president—engineering, Douglas Aircraft Co., McDonnell-Douglas Corp., and Theodore G. Slaiby, director, engine design engineering, Pratt & Whitney Aircraft Group, United Technologies Corp.

I will be presenting an opening statement, followed by Mr. Taylor, who will discuss the certification process in more detail. Following his presentation, among us we will attempt to answer any questions you might have concerning the specific issues which have been raised. We have been informed that four instances have been identified in which it has been alleged the present certification process has been deficient. We believe such allegations to be without merit and we are prepared to address them.

At the outset, let me say that we welcome this opportunity to comment on the type certification process. The actual and perceived safety of the Nation's air transport system is of crucial importance to us as manufacturers. Our livelihood depends on it. Not one of our planes would enjoy a successful market if it were not as safe as humanly possible. There can be no doubt that the aircraft certification process has been a vital element in creating and maintaining the safe aviation system all Americans enjoy today.

That statement was written before yesterday's crash. It stands today. Now I am going to address briefly the outstanding safety record because I think it is very important to put this hearing in perspective.

The evidence is clear: Airplanes made by U.S. companies and certified as airworthy under the current FAA rules and regulations provide the safest and most efficient form of transportation in use today. Many people—principal among them the manufacturers, the operators, the air crews and the FAA—have worked and are working long and hard to see that this is so, and will remain so.

I would like to point out that the average number of fatalities per billion passenger miles for the period 1970–77 was about 20 times as great for automobiles as for the scheduled commercial airlines. Both bus and rail travel were about twice as dangerous as air travel during the same period.

I refer here to table No. 1, which I have submitted for the record.

Mr. BURTON. Without objection, table No. 1 will be inserted into the record at this point.

[The material follows:]

TABLE 1

COMPARISON OF SAFETY RECORDS OF
MAJOR MODES OF TRANSPORTATION IN THE U. S.
(passenger fatalities per billion passenger miles)

	AUTO		BUS		RAIL		AIR	
1970	21.0		1.9		.9		0	
1971	19.0		1.9		2.3		1.5	
1972	19.0		1.9		5.3		1.3	
1973	17.0		2.4		.7		1.0	
1974	13.0		2.1		.7		1.2	
1975	14.0		1.5		.8		.8	
1976	13.4		1.7		.5		.0	
1977	13.3	(16.2)*	1.3	(1.8)*	.5	(1.5)*	.4	(.8)*

*1970 - 1977 average

Based on data from the National Safety Council and the National Transportation Safety Board

Mr. HARR. The comparisons are many, but all demonstrate the exemplary record of the scheduled airlines. During the period between 1950 and 1975, the major domestic U.S. airlines carried more than 1 billion passengers with a fatality rate of only one ten-thousandth of a percent. At the moment, both the United States and the world accident rates are continuing their overall downward trend.

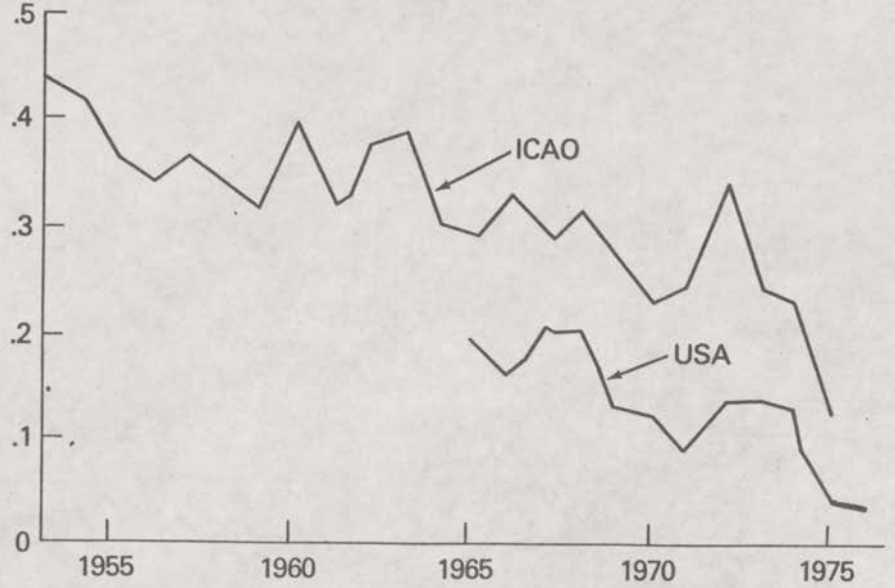
I refer you to chart No. 1, which I have submitted for insertion into the record.

Mr. BURTON. Without objection, chart No. 1 will be inserted into the record at this point.

[The material follows:]

Chart 1

The Declining Transport Aircraft Accident Rate



FATAL ACCIDENTS, RATE PER 100,000 A/C HOURS IN ICAO COUNTRIES (EXCEPT RUSSIA) AND THE USA (TRANSPORT AIRCRAFT, SCHEDULED OPERATION) STATISTICS: ICAO & NTSB

Mr. HARR. I turn now to the certification process. It was expressly to achieve and maintain such a remarkable safety record that the U.S. Government took responsibility for inspection and approval of new aircraft types. Over the years, the certification process has evolved into an extremely effective interaction between highly qualified Government and manufacturing experts. Moreover, similar regulatory and evaluation systems have been created to certify all members of the aviation community—pilots, flight engineers, traffic controllers, and mechanics.

Aircraft certification is a lengthy and complex process. It involves a series of inspections, reports, and evaluations which goes on, day-to-day, for years and continues for the life of the vehicle. The process does not stop with the issuance of the actual type certificate.

Complex though the process may be, the rules that govern safety are developed by all interested members of society. Any and all interested citizens or organizations are invited to, and do, comment on proposed rules or petition for new rules and thus have a very real impact on the aviation safety process. This is, therefore, an open and democratic system. Everyone has a voice. Once enacted, however, the regulations must be respected, enforced, or changed by due process. Public participation in the establishment of the rules is appropriate, but public participation in determining compliance is inappropriate.

The overall process itself, as will be outlined in more detail, consists of three basic phases: (1) establishment of rules governing design, manufacture, and testing of an aircraft to insure its airworthiness; (2) determination by the FAA that the aircraft in fact meets these rules; and (3) establishment of rules for safe operation of the airplane when in service.

All three phases are carefully thought out, interdependent and changed as necessary to accommodate technological advances and lessons learned from experience. The rules necessary to provide maximum safety are built into phase one, the regulations. Certification itself consists of implementation and enforcement of these regulations.

Pilots, in particular, I might add, are intimately involved in aircraft certification. Besides the right they share with others to petition the FAA or comment on proposed rules, pilot groups often visit the manufacturer during the design phase of a new airplane in order to comment on the design of the cockpit or other features affecting performance of the aircraft. Changes are frequently made to accommodate their wishes. Pilots can also affect the design of an aircraft by requesting that the airline require certain features in its contract with the manufacturer.

I turn now to the negative impact of proposed public participation. As I have said, there is overwhleming evidence that the present process is effective. As will be shown in the second part of our presentation, it is also a most complicated exercise. Inclusion of outside parties, even if some methodology for insuring same could be devised, could greatly lengthen what is already a painstaking long-term procedure.

We as manufacturers have learned to live with the length of the process. It is part of our everyday lives. We have no objection to, in fact we enthusiastically support, the taking of whatever time is necessary to insure that aircraft are as safe as we can make them.

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However, the delays which would inevitably result from any conceivable implementation of so-called public participation would be totally self-defeating. Not only would they provide no additional increment of safety, they would defer introduction of more technologically advanced, and therefore safer, aircraft into service. The fact that they could allow competitive foreign aircraft to reach the growing world market sooner than American aircraft, while not to be weighed against safety considerations, would also have potentially serious economic effects. In short, a totally illusory gain is being sought at the price of a known and certain loss.

Second, in terms of disadvantages, we, as manufacturers and part of a competitive system, are deeply concerned about release of valuable proprietary data which could result from further dilution of the certification process. Design analyses, technical data, engineering drawings and test results—all constituting vital commercial assets with a concrete dollar value—are exposed to the FAA during the type certification process. If that process were opened to the public, much of this data would be dispersed to competitor companies, increasing the risk of the introduction of bogus parts, which is already of vital concern.

For example, one manufacturer can achieve a competitive edge over another by designing an aircraft with a lower empty weight, producing additional pounds of payload. Computer analysis and advanced aerodynamic knowledge have indicated that a new wing currently being designed in the United States could be some 10,000 pounds lighter than its foreign counterpart. This equates to 52 passengers. The design data on such a wing are proprietary and constitute one example of information that would be lost to the company which developed them were the certification process to be made more open.

In our view, such trade secrets should not be given away through governmental action unless there were a very real tradeoff in terms of increased air safety and, again, that is simply not the case.

Before turning to Mr. Taylor, I would like to conclude by reiterating my major points. The type certification process, through reasoned change and evolution, has made a major contribution to making American-built aircraft the safest in the world. Part of the reason the process works is that all parties are free to comment on it. If their ideas are good, they will be accepted. To incorporate the public into the day-to-day process, however, would result in an interminable delay in bringing safe, and, incidentally, quieter and more fuel-efficient, new aircraft into service. In simplest terms, we now have in place a sound and time-tested procedure in the area of greatest importance—safety. The real issue is whether the integrity of this process is to be protected or undermined.

I would add one more comment.

One ten-thousandth of 1 percent over a billion passengers for over 25 years works out to 1 in a million. What we are trying to do and what everyone else is trying to help do in the air transportation community, is reduce that from 1 in a million to zero in a million.

It is our feeling, and I think this sets the tone for the way we will be responding to you, Mr. Chairman, is that the worst thing we can do in seeking to reduce that from 1 in a million to zero in a million

is to degrade the system that has gotten us that far. That is the essence of our philosophy.

Mr. BURTON. I do not know if my friend, Micky Cannon, whose wife died yesterday, would think that this system has gotten us very far.

From my experience with this subcommittee in dealing with FAA, they are more sweetheart-connected with the industry than they follow the duty the Congress has given them.

Certainly there is a good record, but I am one of those who think that might be in spite of FAA instead of because of them. I can't, at least today, because of yesterday's events, accept the statement that the industry and FAA have it under control so nobody should worry about it.

Mr. HARR. I was not quite saying that, Mr. Chairman.

I am saying that we are dedicated to building the safest aircraft in the world. We think we do. Eighty percent of the world's aircraft are American.

One of the essential features in making air travel attractive—and we all know it—is actual safety and the public perception of safety.

Mr. BURTON. Air travel is the fastest way to get somewhere. That is why I take an airplane. There are probably more people who die in bathtubs than die in plane crashes. There is certainly a high level of safety. These accidents are the exception and not the rule. But I still think that it is the sheer luck of the Lord, because I don't think the processes are all that straight.

Now, you say that to have people involved in the certification process—we've got the process open right now because of the rulemaking; that the public can go already and muck it up as much as they want.

Once the rule is made they come out with these advisory circulars which, I guess, are almost rulings on the rule. They are more important, really, than the rule because they tell you how the rule is going to be interpreted. To have the public involved in that process would be counterproductive; is that your position?

Mr. HARR. Mr. Chairman, would you bear with me to this extent?

Because of the preparation for these hearings and in our discussions among ourselves and with your staff and with other elements in the community, we think it is terribly important that the record show the process. What we are talking about is the process.

Mr. BURTON. I am interested in that. You made a statement.

It is my point of view that the advisory circulars—are the nuts and bolts of it. They tell you what the rule means.

Who has input into that process; what do you think?

Mr. HARR. Mr. Taylor?

Mr. TAYLOR. I have some charts, Mr. Chairman, which would clarify in many cases the questions you have asked.

If you don't mind, I would like to present them. I think in that way we could communicate much better.

Mr. BURTON. That will be fine. I was just responding to what was said.

Mr. TAYLOR. Here is the first chart.

[Chart shown.]

FAA/U.S. Manufacturer Transport Category

Aircraft Certification Process

1. Establish rules

2. Determine that aircraft meets the rules

3. In-service support

Mr. TAYLOR. As Mr. Harr pointed out, there are three fundamental phases of the aircraft certification process. Those phases are the establishment of the rules and, second, the determination that the aircraft needs these rules. And third, there is the in-service support of the airplane as it is in operational use by the airlines.

It is a never-ending process. It is a cyclical process. I will show you how the three relate one to the other.

As for the establishment of the rules, it is a continuous process which is open to the public. All interested parties do participate. I will show you a chart a little bit later as to some of those that we interface with.

[Chart shown.]

FAA/U.S. Manufacturer Transport Category

Aircraft Certification Process

1. Establish rules
   - Continuous process
   - Open to public
   - All interested parties participate
   - Establishes level of safety
   - Design, manufacture, test, and operation

2. Determine that aircraft meets the rules
   - FAA responsibility
   - Analyses, tests, mockups, simulations
   - Extensive FAA flight testing

3. In-service support
   - Rules require manufacturer and operator to report directly to FAA
   - Service bulletins—manufacturers
   - Airworthiness directives—FAA
   - Accident reports—NTSB

Mr. TAYLOR. These participants in establishing the rules are establishing the level of safety that the traveling public enjoy on the transport category airplanes as they operate both in the United States and around the world.

These rules apply to the design, the manufacture, test, and operation of the airplanes.

They are rules that are not general in nature. Some of them are very specific. They indicate how the airplane should perform both under normal conditions and under emergency conditions.

As an example, they specify the size and shape of switches and controls that are in the cockpit and what direction they should move.

So, the parties are participating in the process here which is specific.

Second, you have the process of determining that the aircraft meets the rules and this is an FAA responsibility. They discharge this responsibility through the examination of much data. The manufacturers provide analyses, tests, laboratory and ground tests, and mockups, and simulators.

Then, there is an extensive FAA flight testing. The FAA people do the testing. The manufacturers are usually with them to determine the characteristics of the airplane, and the performance and its capabilities to meet the rules. The FAA in this process as well as in the next process of in-service report, makes use of DER's, or designated engineering representatives, to do those tasks.

Mr. BURTON. In all three areas?

Mr. TAYLOR. In this area No. 2, that is the determination and also in the in-service support.

I have a chart that will show how the DER's are used.

The DER's are the best people in the Nation to do the jobs that they are doing. They know more about the engineering design. They have more data at their disposal than anyone else. That is the reason why we believe——

Mr. BURTON. They are employed and paid by the company?

Mr. TAYLOR. Yes; and they are certified by the FAA as being a designated engineering representative.

They are designated to do certain tasks. They do a very great multitude of the tasks that are to be done. They analyze. They write reports. They see if the data is correct. They determine whether or not a specific set of data, like a stress analysis, meets the rules.

All of the data that the DER does is subject to the approval of the FAA. In a later chart, I will show you how that enters into the certification process.

We can say a little bit more about that later.

When the airplane is put into service, each one of the manufacturers has a service representative at the major airlines to communicate with the airlines on any in-service difficulties that they might have.

Aside from that, the rules that are established by the public require that the manufacturer and the operators both report directly to the FAA any——

Mr. BURTON. The rules are established by the FAA, are they not?

Mr. TAYLOR. The rules are established up here in open rulemaking.

Mr. BURTON. But they are established by the FAA. The public can come up and say anything and everything, but they do not make the rules. The FAA makes the rules; right?

Mr. TAYLOR. The rulemaking is made by the FAA, yes.

Mr. BURTON. The public can make their views known.

Mr. TAYLOR. The public can and does, and they have an opportunity to comment on all of the proposed rules. These comments are used by the FAA to judge whether the public wants a change or not.

Mr. BURTON. I see. Please continue.

Mr. TAYLOR. When we find a condition in the airplane that needs attention, that is, the airplanes in service, the manufacturers issue a service bulletin. I will cover that in my next slide.

All of the service bulletins go to all the airlines, and they are given to the FAA, and the FAA determines if they believe there is a safety condition that should be corrected quickly and mandatorially, then they issue an airworthiness directive to the airlines.

A word about the service bulletins.

We can provide the airlines with the best information. We can tell them how critical we believe it is, but the manufacturers have no responsibility in law to require them to change the airplane.

That is the difference here between the service bulletin and the airworthiness directive. The FAA, with the airworthiness directive, has a legal responsibility to make a mandatory change to the airlines.

We also use the National Transportation Safety Board's accident reports. We use those accident investigations and those reports to determine conditions which we believe might be better fixed and better changed in our airplanes.

Mr. BURTON. Let me ask a question here.

Where do the advisory circulars and the internal orders come in?

Mr. TAYLOR. The advisory circulars are issued by the FAA as necessary, as the name implies, to "advise" the aviation community.

Mr. BURTON. Advise them of an interpretation or of a change in the rule?

Mr. TAYLOR. There is a wide variety of subjects covered. They may be informative in nature.

Mr. BURTON. All of us know the kind I am talking about.

Mr. TAYLOR. The kind most appropriate to the manufacturer is the kind that says: "This advisory circular can be used but is not the only means with which to show compliance with a rule."

Let me give you an example.

The advisory circular may say that you can conduct an analysis on a computer, and you can use a distribution that they set out.

However, an equally good method of meeting your requirement would be for us to go out and take an airplane, and conduct a test, and show through tests that we meet the rule. This is often the case.

This is often the case when you come down to getting a type certificate. The FAA is not satisfied, let's say, and they don't have enough data, and they are not completely satisfied that the airplane is airworthy.

We say: "What does it take?" They may leave it up to us to decide, and it may be up to them. But, we will go back and do a test on an airplane and give them the data, or they may participate in the test until they are completely satisfied.

So, the advisory circular would be used as one means to meet a rule, but it says it is not the only means.

Mr. BURTON. Would they establish a rule and then, in effect, by advisory circular either give a legitimate option as to what the rule states or, in effect, really change the rule from what the public thought it was when it was adopted?

Mr. TAYLOR. That is a good question.

They cannot change the rule by an advisory circular.

Mr. BURTON. I see. They do not change the rule but, in effect, by their ruling, they can obviate the rule or modify the rule or give you options as to how to meet the rule. Isn't that correct?

Mr. TAYLOR. To be correct, I think you are correct, Mr. Chairman. I do not recall an advisory circular or an aircraft certification that eased a condition in any way.

Maybe someone else on the panel could say that.

It is usually to toughen up or to make sure that you meet the rule.

Mr. BUTTERWORTH. It is not a question of weakening or strengthening. I think we are trying to get at this.

Because of its detail, the advisory circular often becomes the operative standard against which you are supposed to certificate. For instance, take your fail-passive autoland system. You have AC 20–57, 120–28(a), and 120–29. Those are the standards against which that system was judged.

Mr. TAYLOR. That is one standard.

Mr. BUTTERWORTH. OK. Your documents cite that as being the main standard.

Mr. TAYLOR. It could be.

Mr. BUTTERWORTH. They are pretty detailed.

Mr. TAYLOR. Yes, they are.

In some cases they give you a choice. They give you a choice of going on and making a test or conducting a computer analysis.

Mr. BUTTERWORTH. So, you are either going to have a standard set by a circular, or you are going to have a standard set by a region on its own. That may not necessarily be illegitimate, but it is done.

Mr. TAYLOR. I am not quarreling with you. I am thinking about the word "standard." The standard is the Federal Aviation Regulation.

Mr. BUTTERWORTH. I don't want to use this word standard that way. Rules or regulations are in the FAR's.

Mr. TAYLOR. It still has to be met. The rule still has to be met.

Mr. BUTTERWORTH. That is no problem. But the FAR's can be vague. Look at the size of the rules that you had to judge the fail passive autoland system by, and then look at the detail of the advisory circulars implementing those rules.

Mr. TAYLOR. The advisory circular on the automatic landing is a good case in point. This is where the FAA is looking at all elements of the aircraft system, that is, all elements of the aviation system. We are building an airplane. In that advisory circular it defines what is required for airborne equipment before we can certify the equipment that then goes out in the airplane to be used by an operator. It defines the system characteristics of the ILS, the marker beacons, and it defines specifically what that piece of equipment must be able to do in order to be used in a category III–A or a category II approach.

That is one good value of the advisory circular—it draws together the total of the aviation system so that each person—the manufac-

turer, the operator, the pilot—knows what the total system performance needs to be.

Mr. BUTTERWORTH. It sounds to me that you are describing the most important document for you. That is the way it sounds.

Mr. TAYLOR. I did not mean to imply that.

Mr. BUTTERWORTH. It is not that the FAR's are insignificant, but that is the document you have to use in designing your system.

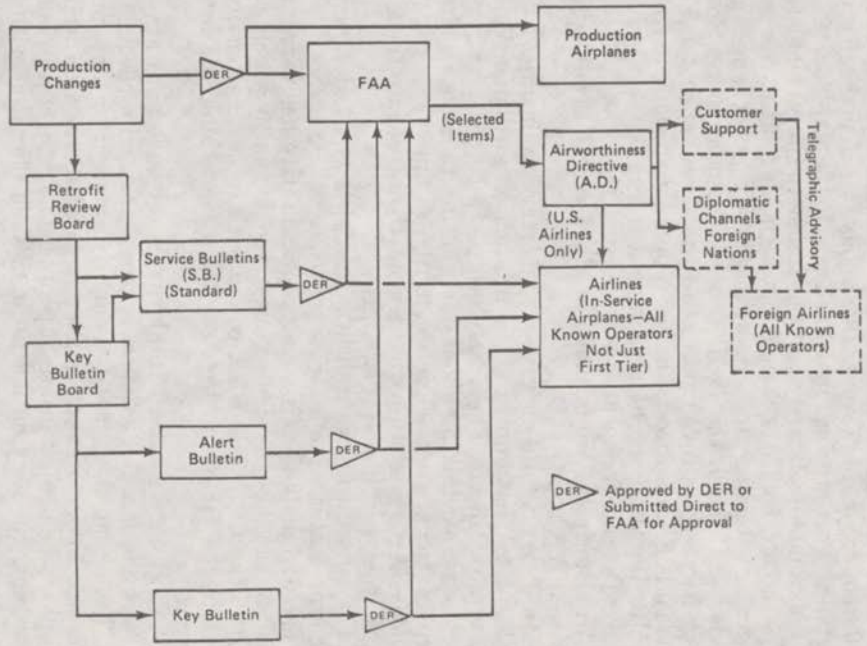
That document is not public. Comment is not guaranteed on the advisory circular.

Mr. TAYLOR. Are there any more questions on these so far?

We now have another chart.

[Chart shown.]

Production Change, Service Bulletins, and Airworthiness Directives



Mr. TAYLOR. A customer comes to us and says, I would like to have a different engine, or I would like to have an airplane that goes a further distance. Then we must make a change to the airplane.

We cannot arbitrarily make a change to the airplane that is already type certificated. Any change that we make must have a certificate on it, so we are starting up here with a production change. The change is reviewed through the DER process, in many cases. Some of the information is approved subject to the approval of the FAA. In some cases it is FAA approved before it goes into production of the airplane.

Mr. BURTON. I would hope in most cases.

Mr. TAYLOR. It depends——

Mr. BURTON. I would hope in all cases. You could start producing before FAA approves it.

Mr. TAYLOR. I did not say we could start producing.

The FAA has approved the production airplane. We have received the type certificate. That is in phase 2.

Now we are talking about our wanting to make an alteration to the airplane to put a new engine on it, for example.

The FAA must approve the work that goes into the airplane. They must approve it in one of two ways.

They must approve it either through a DER, designated engineering representative, or approve it themselves.

The designated engineering representative has very strict limits on what he can do. It is spelled out in the document which we have. Their work is audited. The FAA comes back to us occasionally. They come back to the DER and they say, "I do not think you interpreted this correctly."

A discussion ensues. I think this is very good in the system. It provides a check and a balance. It is a check and a check.

That is one thing good about the aviation history, not necessarily this one. In our organization we have what we call a technical staff of people and a project group of people. The project people release all the drawings, but they do not do it without checking with the technical staff.

In this way we get a lot of internal arguments as to whether it is good.

However, it produces a very good product because you have the check and balance system.

I think the same thing is true here.

Once the change that we have made to the production airplane is made, we have a retrofit review board within the companies. Those boards are reviewing the type of changes that are being made to determine whether that change would be advantageous to the airlines, or whether they would be required by the airlines, or whether they would help in the maintainability and operability of them.

These are issued as service bulletins. The service bulletins are either standard, alert, or key. The standard bulletins handle the routine changes that go to the airlines.

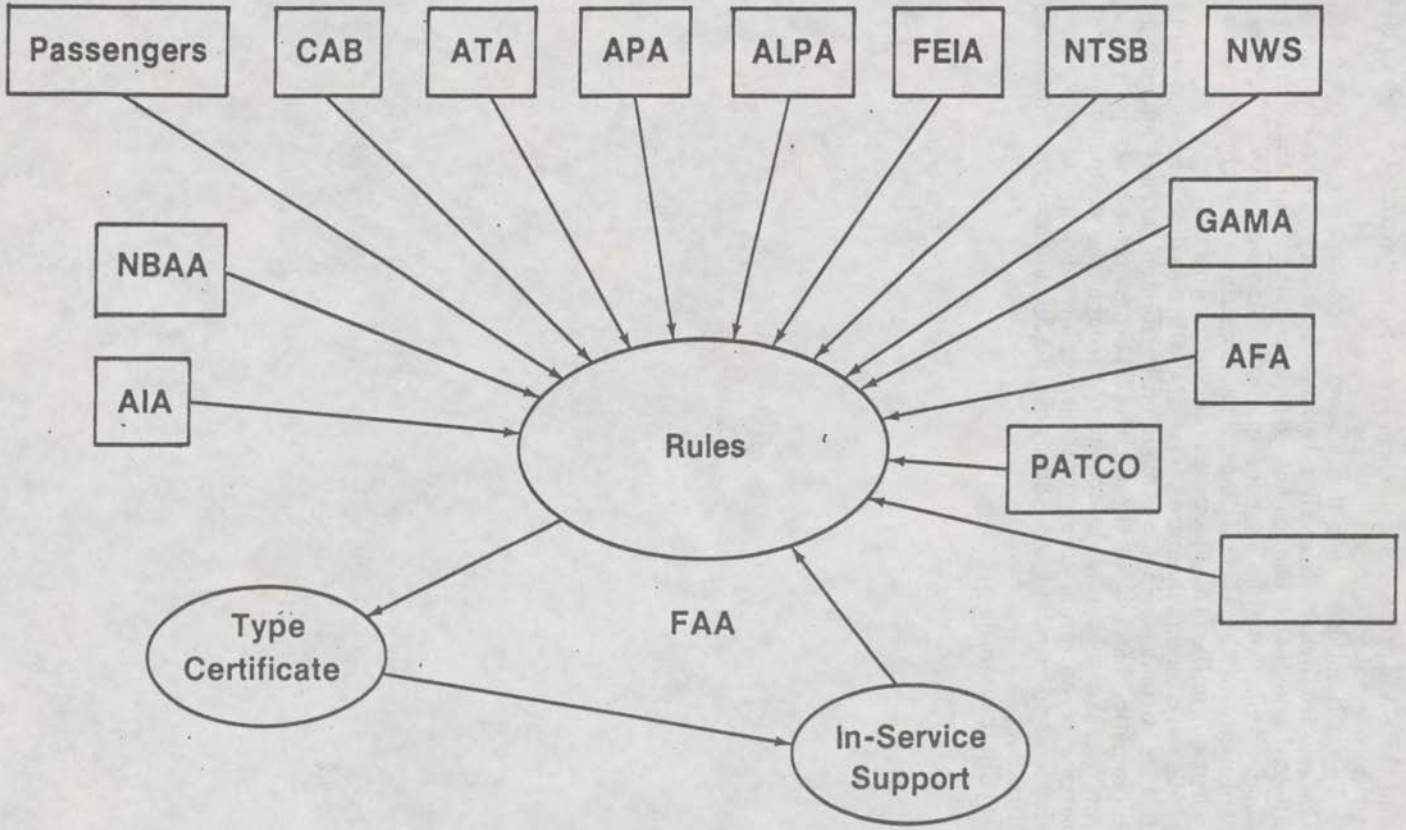
A key board decides on those issues which we believe are safety items that should receive the attention of the airlines. Those are sent to them as alert bulletins. Those which we believe should receive the key management attention, we call key bulletins and they are sent to the airlines.

You will note that all of the service bulletins go through the DER and the FAA process. All of them are approved before they go to the airlines.

You will notice up here that all service bulletins come to the FAA. On selected items where they believe the safety of the airplane is affected and that a change should be mandatory, and that a change should be immediate, they issue an airworthiness directive. They send it directly to the U.S. airlines. That sometimes goes by telephone, telegraph, or the fastest means possible to the airlines.

We have foreign operators. The airworthiness directives that apply to U.S. airplanes which are operated by foreign carriers go through diplomatic channels to the airlines. The manufacturers provide a service. We take that information through the customer support service organization using the telegraphic advisory to make sure the foreign operators know about the FAA mandatory airworthiness directive.

[Chart shown.]


Passengers
CAB
ATA
APA
ALPA
FEIA
NTSB
NWS
GAMA
NBAA
AFA
AIA
Rules
PATCO
FAA
Type Certificate
In-Service Support

Mr. TAYLOR. Let me return to the rulemaking process in this chart here. I think I have described to you that the rules are established, and the type certificate is obtained, and the airplanes that are in service are supported by our engineering organization by feedback.

When I made up this chart, I wanted to be sure I had everybody on it. I put the names on here. I have shown it to several people at the Boeing Co. Each one of them said that I had forgotten somebody.

Mr. BURTON. Let me say this: We will stipulate that there is broad participation in the rulemaking process. I don't think you have to name every group that is there.

Mr. TAYLOR. These are elaborate meetings, and they go on for a long time.

But there is one thing that is very important. The people here have good ideas. They do not necessarily change the rules. I doubt that the Air Line Pilots Association think that their batting average on this is any better than ours.

Mr. BURTON. I think yours is better than theirs.

Mr. TAYLOR. I do not believe that is true. I do not believe it is true; no.

The important thing is that all parties are heard. All information is out on the table. It is recorded. The comments are received.

I review quite a few of those. We have looked at a lot of those. We have made some improvements to airplanes as a result of people getting it out on the table. The process is good.

It does not mean that every time somebody thinks a rule ought to be changed, that it gets changed. It has to be supportable. You have to have information. You have got to have good data.

Mr. BURTON. You can be there and hear an idea that you did not think has a great deal of merit. Is that right?

Do you have to accept it in some way?

Mr. TAYLOR. At least we get an opportunity to look at it and digest it——

Mr. BURTON. I thought I interpreted what you are saying to be this. There are things there that you initially did not think of and which were not a part of your original idea. In effect, if you had thought of it, you would have put it in, and you pick up information in these meetings. Isn't that right?

Mr. TAYLOR. I don't want to speak for everybody, but it is true in our case. I believe so.

Continuing the thing that bothers us the most is the fact that this is a long 4-, 5-, or 6-year process in obtaining our original type certificate on a new airplane.

We already know how complicated and how long it takes in the rulemaking process. It is very difficult from a practical point of view for us to imagine how we could ever certify another airplane in the same process, if the public were more involved. That is a hangup that we have. That is one thing that Mr. Harr pointed out.

Mr. BURTON. I wonder why it takes them so long to come up with a type certificate.

However, following issuance of a type certificate, is it not prudent for you to wait for that advisory circular so you know exactly what you have to do or how you can meet the rule? You gave the example of actual flying versus simulation.

Mr. TAYLOR. You get the type certificate in the first place——

Mr. BURTON. Let's assume you have that. I am talking about after you get that. Are you going to commit to production and everything prior to getting that advisory circular?

Mr. TAYLOR. I do not know how to answer that question.

The advisory circulars are issued on a continuous basis throughout the system and they aren't all on the certification process.

Mr. BURTON. We are stipulating that I am only talking about circulars that deal with the certification process.

Let's say that they are telling you what standards are necessary to meet that rule.

Mr. TAYLOR. That is one way to tell us that we need to meet a rule.

When we are trying to get a type certificate, or when we are trying to get a change made, the FAA tells us what testing we have to do and what analysis we have to do before they will approve it.

They may refer to an advisory circular as a means, but they might say, "We will not approve this new electrical system until you show us by analysis the results." They require that we have no faults, and they want to see a test at the end. They are the ones that stipulate the testing required for them to approve a product. Whether that is a new type certificate or whether that is a change to a type certificate, that would be the process.

That finishes my charts.

Mr. BUTTERWORTH. The process by which you obtain a type certificate takes sometimes as much as 64 or 70 months. It is a long, involved process.

Mr. TAYLOR. Yes.

Mr. BUTTERWORTH. The company has expended sizable resources and is committed. You don't want anyone "messing around" with your system. You want to know the standards against which that aircraft is going to be certified. You want to know the standards beforehand.

What happens if operational experience should prove in midstream of certification that the previous standard, which the FAA had told you you were going to be certified against—is no longer adequate. Do you pressure the FAA? Do you say to the FAA, "We had a commitment from you that this was the standard we would be operating under"?

I can see why you would be motivated to do that.

Mr. TAYLOR. Because we are where we are in the new airplane program, I can give you a couple of good examples.

There was an AD on the wide-body airplane to put floor venting in all of the wide-body airplanes. It is not a rule yet. However, we have applied for a type certificate. The FAA has told us on what basis they will issue the type certificate. But they told us they are going to issue special conditions to us requiring us to meet that.

They have just told us that. That is part of the rulemaking process which they have.

There is another example—tires, wheels, and brakes—they have told us that the current standards in the rules are not adequate. We are going to have to meet special conditions. We don't know what that is yet. We have been working on it. All the data that is available in the industry from the manufacturers and so forth has been consulted. We keep our people up to date.

We do not have that yet.

Let me answer your question this way. If you as a private citizen believe this afternoon that the level of safety is not adequate, you can petition the FAA to change the rule.

If you have adequate basis for that, they will issue a notice of proposed rulemaking, and if they think it is urgent enough they can direct that a special condition be applied to that new airplane that is not yet produced.

Mr. BUTTERWORTH. That is not the question I was getting at. I wonder what problems are posed for the manufacturer when standards change. Does he therefore exert pressure on the FAA not to change those standards?

It seems logical to me that he would.

Mr. TAYLOR. We want to provide the safest airplane possible. There is no question about that. We cannot tolerate having an airplane in the system that is unsafe. It would not sell.

Mr. BUTTERWORTH. Thank you, Mr. Chairman.

Mr. BURTON. The flight attendants testified this morning. They were talking about the fact that one of the jumbo jets was in production before certain equipment was certified and that there still never was a regulation on the escape hatch in the lower galley. Whatever company it was, after some form of pressure was exerted, at least came up with a modification.

Mr. HARR. Mr. Dubil could answer that.

Mr. DUBIL. I would be happy to address that one. When we first designed the DC–10, we took it upon ourselves to put an emergency escape hatch in the forward part of the galley on the right-hand side. This was accomplished, if my memory serves me right, in the 1968–69 timeframe.

I would like to state, Mr. Chairman, that we invited the stewardesses in to evaluate the lower galley arrangement, our elevator lifts, and our emergency egress system at that point in time. A few minutes after lunch I did talk to the stewardesses and informed them of this evaluation and the statement was, "Well, maybe we got the wrong people." Maybe Douglas invited the wrong union.

I feel very bad that the statement was made that Douglas has a lousy reputation with the stewardesses, because I think we try. We had them involved.

Mr. BURTON. Maybe that is because you do not call them flight attendants instead of stewardesses. [Laughter.]

Mr. DUBIL. That may well be. I am a first generation foreigner and I bow to my problem with the English language.

Mr. BURTON. It took me awhile also. [Laughter.]

Mr. DUBIL. I do not think that is why they are mad at me, though.

Mr. BURTON. It indicates a state of mind, I think.

Mr. DUBIL. To evaluate the emergency escape hatch, we did have flight attendant inputs. We also had one of the cooks from United Airlines who came down. He was the heaviest one they could find because they could envision that some time they would have him on board the airplane. He had something like a 48-inch waist. We demonstrated that he could get through the hatch, and we also demonstrated that a woman with a 42-inch bust could make it through the hatch.

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When we went to the convertible freighter, which is the point in question, you could envision arrangements of that airplane where that airplane would fly with partial cargo and partial passengers. You could envision a situation where that forward hatch would be covered by cargo. Even if it were not covered by cargo, it would be covered by some of the additional tracks that were required on the floor to properly tie down and restrain the cargo.

We did look at alternate means, like taking up a track segment when in a passenger mode. We worked with the airlines on this quite diligently. Frankly, this complaint in the hearing hit me by surprise. I was not prepared for it. I cannot validate at this point whether or not we did have inputs from the flight attendants complaining about the situation.

I can validate that every convertible freighter that we delivered did have that access in it. The access did have to move aft in the compartment. It is almost adjacent to the other accesses which are provided in that compartment.

What we did in the original 10, and it is true of all of them that have the lower galley—we have a passenger lift and a cart lift. In addition to that, between the two lifts, the structure is such that we provide armholes and footholes so that you can physically go up between the two if indeed the situation arises.

On all convertible freighters we added this additional hatch that is within about 3 feet of the other hatches provided.

I do not think I can state anything else. I hope the attendants accept my apology for calling them "stewardesses." I have given them my card. If there is any situation in the future where they feel that they have a comment that Douglas should take into consideration, I hope they will feel free to call me.

Mr. BURTON. One of the problems with the hatch was not whether or not somebody of any particular size could get through when it was open but, rather, that there was no mechanical means of opening it if the electricity failed. I think that was their concern.

I suppose it is the FAA's problem that they never had any regulations governing the lower galley compartments below the passenger cabin at the time that the piece of equipment was being constructed.

So, they were not giving you any guidelines, as such.

Mr. DUBIL. There were no guidelines, but each of the manufacturers worked with the FAA on what they felt would be a proper situation.

When you say that the electrical system fails, it will have to fail when the cart lift is in the absolute up position. Otherwise you still have the mechanical means between the lifts of getting up to the upper deck, in addition to the other egress that the attendants were talking about earlier.

So, it is a question of how many means do you need.

Mr. BURTON. It couldn't have been too big of a problem for you, because after something happened, you finally established the manual egress to be used in the event there was a electrical breakdown; is that right?

Mr. DUBIL. We did add the second access to the airplane before it was delivered; yes.

Mr. BURTON. Mr. Butterworth?

Mr. BUTTERWORTH. Before we get into the cases, I have a couple of questions about the DER's. In the system of checks and balances that is the surveillance of DER's by FAA, I presume that there is a point at which they are checked by an FAA employee.

You made a previous statement that the DER is a DER basically because he knows more than anyone else about the particular design problems that he has either contended with or must contend with in the future. That is why the FAA chooses him.

Do DER's generally know more than FAA employees about a particular aircraft or system?

Mr. HARR. May Mr. Frisbee make a comment on that?

Mr. FRISBEE. The answer to your question, Mr. Butterworth, with regard to the DER's knowing more than anyone else about their particular area on particular airplanes is, yes, they do.

That is why I think all of us feel that the application of that kind of expertise by all of the major manufacturers to the problems of certification represents one of the major strengths of the certification system. That kind of expertise could only be obtained in the area where the invention of the technology, as well as the development of the technology occurs.

The capability, of course, is based on the natural talent of the DER's. They are some of the best engineers we have in the world.

If you were to pull the practiced, fresh experience away from the DER's, in 2 years they would not know much about a particular airplane. So, the fact that they stay close to the airplane, with both an independent responsibility to the FAA and a responsibility to themselves for meeting professional standards, results in probably the best combination of the kind of talent we could bring to bear in certification. So they are the best that is available, and they have the kind of understanding of the specifics of the systems that the FAA needs.

Mr. BUTTERWORTH. Knowledge in a technical debate is power. I am trying to imagine an interface between an FAA employee and a DER.

If the DER knows more about the particular subject matter than the FAA employee does, it stands to reason that, in a sense, he has an advantage. Not that he is trying to pull anything over on anyone, but just that the FAA employee will not understand as much.

I don't want to impugn the integrity of anyone here. I am just looking at one of the particular checks you mentioned. What is your response to that?

Mr. FRISBEE. Let me respond to that. I think that you can liken the utilization of experts in the companies as aids to their counterparts in the FAA to the use of the experts in the company who are responsible to a division chief or chief engineer.

Hopefully, the experts in the various fields of aviation technology in Boeing, Douglas, Lockheed, and elsewhere, know more than the chief engineer in their particular fields of expertise. However, the chief engineer brings them to an accounting on the final decisions to be made. He expects them to use the capability that they have to lay out for him in terms that he can understand why they have done what they have done. Being an engineer, he has the ability to understand what they say. If he had to go and dredge it all up for himself in each and every area, there wouldn't be enough hours in the day.

So, a DER, knowing more than his counterpart in the FAA, doesn't mean that he is going to overrun his counterpart in the FAA because that man has the responsibility for final approval.

Mr. BURTON. Here is the point. The possibility is here. When someone works within the company and they try to con their supervisor and the supervisor finds out about it, they will be looking for work.

If a DER tried to razzle-dazzle the FAA—and I am not trying to impugn anybody in particular—and if the FAA does not control the DER's job, that person may no longer be the FAA designee. However, the person works for the company that he or she, in effect, is supposed to be policing and certifying the reliability of equipment.

That is just a fairly tough situation to be in.

Mr. FRISBEE. Let me respond to that, Mr. Chairman.

Several of the points that have been made—and these are not always accepted—are these: The engineers who are appointed by Boeing, Douglas, and Lockheed, and who meet the standards of the FAA, have to be accepted by the FAA, and they are engineers of top level technical ability. They recognize that.

So, they have a large amount of professional integrity and a lot of pride in their capabilities. They do not feel that they have to take anything from the standpoint or arguments about their technical judgments from their bosses. They feel——

Mr. BURTON. Which boss are we talking about?

Mr. FRISBEE. Their company boss.

Mr. BURTON. I see. Please proceed.

Mr. FRISBEE. Once appointed as DER's, they accept the DER appointment as a confirmation of this technical professionalism. They wear it as a badge of honor. They feel that this justifies their standing up and arguing and exposing their differences with the company where they think there are differences with regard to the certification requirements.

They also recognize—and this gets a little harder—that they are legally responsible for their decisions and their signatures. So, independent of the company, once they have approved a design and submitted it to the FAA as representative of the certification requirement and have said that it meets the certification requirements in a particular area, they are legally responsible for showing that in the event they are called to task. They recognize that.

Last, but not least—and your comment today, Mr. Chairman, will make it easier for you to understand what I am saying—their families also fly in the airplanes. There is not one of them who wants to be labeled as the guy who invented a booby trap.

Mr. BURTON. It was stated in testimony that there was no clear evidence to warrant a change in certification standards in the area of wet runways. If not, then there ought to be something done; don't you think?

Mr. TAYLOR. I failed to mention one thing that I should have in my presentation, Mr. Chairman.

I believe that of all of the four cases cited for us, none of those are represented as dealing with the question as to whether or not the product met the rules. They are questions of whether the rules are adequate.

Mr. BURTON. We stipulate that. We may have a feeling that the rules aren't adequate.

Mr. TAYLOR. I think that is the case on the wet runways. What the pilots say is that they think they need longer runways for the dispatch of airplanes in wet conditions.

Maybe I could comment on the movie that we saw this morning about the wet runways.

Mr. BURTON. Please proceed.

Mr. TAYLOR. The FAA certification for wet runways requires that you demonstrate the capability on the dry runway. The reason for that is that there is a good yardstick on dry runways.

When we repeat the test for the same airplane at the same weight and come into the same speed, we can repeat the stopping distance. So, that gives us a good yardstick to measure the airplane's performance.

When the airplanes first went into service, that is the jet 707, which was the first in 1959 time period, those airplanes were used internationally. They were taking off from long runways and landing on long runways. The stopping distance of those airplanes was not a problem because their stopping distance was only about half the length of runway for the takeoff.

But when those same airplanes and others were put into service on transcontinental flights and there were some stops made at St. Louis and others where the runways were not as long, there were some overrun conditions.

In 1962 the airlines decided for wet runway conditions they would automatically increase the length, the certified length, by some 10 to 12 percent. From their own experience they did this.

This has been a problem for quite some time and the record will show open hearings on this and a lot of public debate on this since that time, about 1962 till now.

Much testing has been done. The FAA put in the 15-percent rule in 1965. It has provided a satisfactory length for operating off of the wet runways.

Now, in the movie you saw a 727 being tested on very wet runways. It showed a locked wheel condition. When the FAA put in the 15-percent rule, they also said that if you did not want to accept the 15-percent increase, you could test the airplane on wet runways and that would be satisfactory.

We tested the 727 on a wet runway. It was about as wet as we could get it. It was in Seattle and we used the same technique that was used in the movie where we took the water truck and sprayed the runway. Unfortunately, the crown in that runway was more and the water ran off more than we had realized when we tested it.

We tested it and we got a stopping distance less than 15 percent on a 727 airplane. We did not get the locked wheel condition.

It was when the FAA was doing these tests that you saw in the movies that they discovered, and we discovered, and the industry discovered, the locked wheel condition.

So, we changed the system. We issued a service bulletin to all the airplanes that were in the field and changed the production airplanes. There has been much improvement in the antiskid conditions since that time on our airplanes as well as those of Douglas and Lockheed.

In the testing on the wet runway, there is still not an adequate test vehicle to determine how wet the runways are. That is really the

problem why we cannot today change the specification, so we have gone back and looked at the safety record. In a very large conference in which the airline pilots participated as well as the manufacturers and the antiskid component manufacturers. This conference also included the air transport industry and the airlines. They looked at 93 accidents that had been attributable to wet runway conditions. I should have said "slick" runway conditions.

In all cases none of the accidents could have been averted by changing the rule from the 15-percent rule. It was because many of these accidents were off the side of the runway or because of ice or slush.

Mr. BURTON. How about a rule calling for runway grooving?

Mr. TAYLOR. In this testing it has been evident—and the movie showed it—that if you groove the runway, you can restore the friction coefficient back to nearly dry conditions. We as an industry, the AIA and the ATA, as well as the ALPA, I think universally believe that grooving the runways is by far the best way to go to help in stopping the airplane.

There is some testimony in Congress that says that it would take $32 million to groove 350 runways. I have not checked that arithmetic, but that does not sound like very much.

Mr. BURTON. Especially with the money they have sitting in their trust fund.

Mr. TAYLOR. That's right. We certainly would endorse grooving the runways.

Mr. BURTON. Did your organization members petition FAA to withdraw that film?

Mr. TAYLOR. Not that I know of. I will go back and look. If we have a letter asking FAA to do it, I will send it to you.

However, we participated in the testing.

Mr. BURTON. The Crane Hydro Air Division sent a letter. Then there are specific comments by Boeing and Douglas. This is a bad copy that I have, but I could not say that you are the ones who in your comments said that the movie should be withdrawn. Your comments may have pointed out what you saw as inaccuracies in the film.

Mr. TAYLOR. We participated in the test. We thought originally when we got the locked wheel condition that the system was malfunctioning. But it was pulled out and tested and it was not malfunctioning. The system needed a change and we changed it.

Mr. BURTON. Ms. Halterman?

Ms. HALTERMAN. Mr. Taylor, I wonder if you could comment on Mr. O'Brien's remarks this morning about the five assumptions, particularly the assumption that no malfunction would take place under 50 feet.

Mr. TAYLOR. We have looked at the French experience quite a bit to try to understand the airline pilots' comments on this. We do not know nearly as much about the French system as we do the American system, so I would like to try to relate to the 727 autolanding system.

The five conditions that they have pointed out, while they call them assumptions, I do not believe that that is quite true in our case. Admittedly, if that is what they want to call them, that is fine.

We were talking about the assumptions.

It was our intent in the design to make sure that the pilot could always go around from any position on the approach. That was regardless of where he was.

The autoland system which was designed has been certified from an airborne standpoint.

The reason why we can say that he can go around in any position on this is that the pilot is required to monitor the ILS all the way down. If he very carefully checks at the 300-foot level and the 200-foot level—these are radar altitudes—and at the 100-foot level, and if he has the airplane stabilized on the glide slope and on the localizer, and if at that time there would be a fault in the system of any kind as he went through that "window" he would hit the touchdown point within about plus or minus 25 feet of the center line and within about 1,500 feet long. That does not use up all of the permissible touchdown that is permitted by the rule.

Now, in terms of going around, if he initiates a go-around from a 50-foot height, this would be the most logical time for him to initiate a go-around, if in his opinion at that time he did not have adequate visibility to land. Then he would rotate the airplane as he disengaged the auto pilot, and he would lose about from 15 to 25 feet. He would pull up the airplane to the commanded position by the flight director It is a body angle of about 15 degrees and he climbs up quite markedly.

This means that he would have adequate clearance over the ground from the 50-foot decision height if he were to go around.

Now, if he were to subsequently find out, as he goes beyond the 50-foot decision height, that the weather has subsequently deteriorated—it is not likely to happen in that few seconds but it could—he can still initiate a go-around. It then depends on what altitude he is. If he is, let's say, 30 feet, he will probably not touch the runway. If he is below 30 feet, he will touch the runway in his process of going around and there is nothing wrong with that.

In the process of going around, he automatically would flare and the wheels would touch down and he would be commanded to climb up normally.

So, that is why we can say that he can go around all the way down the approach. We have demonstrated that. There is no problem with it whatsoever.

Mr. BUTTERWORTH. Where have you demonstrated that?

Mr. TAYLOR. In Seattle.

Mr. BUTTERWORTH. Through the simulator, or by what means?

Mr. TAYLOR. By actual flight tests.

Mr. BUTTERWORTH. How many tests?

Mr. TAYLOR. I do not know the answer.

Mr. BUTTERWORTH. Could you supply it for the record?

Mr. TAYLOR. Certainly.

Mr. BURTON. Without objection, the record will remain open at this point for the purpose of inserting the additional information.

[See app. 4.]

Mr. TAYLOR. The next question on the five assumptions is the runway visual range of 700 feet.

In the advisory circular that you were talking about awhile ago, Mr. Butterworth, you pointed out that it has in it the various require-

ments for the certification. Our airplane is certified to meet the requirement for the airborne equipment. The airplane with the autoland is not yet in operation in the airlines for category III–A approaches. It will not be in there until the ground equipment is certified and until the airlines have the airplane and until they have trained pilots to make approaches which are identified in the circular. Then they will submit to the FAA a request for approval.

As far as I know—and you can check this with the FAA—I believe their intent is to do exactly as we think it ought to be done and that is to progress. They will probably get a 1,000-foot RVR approval first before they ever get 700.

The autoland systems that we have built so far and which are in service today and which operate at a 100-foot decision height have some 75,000 landings on them. They are the most accurate landings that are made today.

I noticed one of the witnesses talking about the accident history where landing is one of the worst. That is correct.

In the autoland, we have an aid which helps reduce the probability of those accidents because it takes the airplane right down through a very small window to get a touchdown dispersion which is much lower than normal landings under the VFR conditions.

The next condition was the cockpit instrumentation. It is independent of the fail-passive system and is quite adequate to do this.

Going through the 100-foot decision height in determining whether or not you have a stable approach, plus or minus one dot on the glide slope, is quite adequate. That is a very big indication in the cockpit. It is a very small movement. It is plus or minus 12 feet on the glide slope.

The localizer position can be off half the width of the little indicator and still land within that parameter plus or minus 25 feet.

Insofar as the ground portion of the ILS system is concerned, the test that we conducted had a dispersion in the order of plus or minus 25 feet and 1,500 feet with the anomalies that are now in any ILS system used. So it is not really that we believe that it is 100 percent. However, all of the ILS systems approved at category II airports have a monitor system on them. If the localizer or the glide slope drifts a very, small amount, the monitor will shut off that transmitter. It switches it over to a standby transmitter. If that standby transmitter is inoperative or still putting out a poor signal, even the monitor that the FAA has are duplicated.

If the second transmitter fails, then the system shuts off. The pilot goes around.

So, we are using the reliability of the currently installed category II ILS's when we demonstrate the performance.

I believe that answers that question.

Ms. HALTERMAN. Thank you.

I have one other question on the designated engineering representative process.

The certification processes of all parts of the industry including pilots and mechanics, involve designees, do they not?

Mr. TAYLOR. Yes, a designee process is used to adopt——

Ms. HALTERMAN. How about mechanics and pilots?

Mr. TAYLOR. My voice is giving out. How about Mr. Frisbee?

Mr. FRISBEE. The answer is "yes."

I commented a while ago on the DER. The DER seems to be the one getting all the attention. The DER is only one of six different categories of designees. The designated engineering representative is the one who approves and looks at design work. His qualifications and requirements and the method by which he is appointed are outlined in FAR part 183. The DMIR, the designated manufacturer inspection representative, is a man who inspects parts. He is the one who looks at the hardware in the factory to make sure it conforms to the drawings which the FAA expects it to conform to. He is also approved under part 183.

You have six other categories. Excuse me, that is four other categories. The aviation medical examiner is a designee. The pilot examiner, which includes the pilot examiner, their instrument rating examiner, the airline transport pilot examiner, are all designees. They are not FAA employees.

So, it works the same way for them as for the DER and the DMIR. They use the FAA rules to decide whether or not the pilot is qualified. Of course, some of them are doctors.

You also have technical personnel examiners. These include designated parachute riggers, air-traffic-control tower operator examiners, designated flight-navigator examiners, designated aircraft dispatcher examiners. These are the ones who prepare those people who operate control towers and operate the release of aircraft and do all of the control work on the fields. They are approved by designees, too.

So, there are some nearly 9,000 designees. Only approximately 1,000 of those are DER's and DMIR's.

Also, there is something else that we should cover here. This has to do with what a DER designee and a DER in particular cannot approve.

He can gather all of the information necessary, pull it together, make sure that it is organized, make sure that all the things on the checklist that have been agreed to by the company and the FAA for presentation at the time of certification are done to his satisfaction, and sign it off. He can then bring it to the FAA office for final certification.

However, the DER cannot approve the regulatory basis. He cannot change it.

Mr. BURTON. What do you mean by the basis? Do you mean the FAA rule?

Mr. FRISBEE. Absolutely. He cannot modify it.

Mr. BURTON. I hope not. Neither can an FAA employee.

Mr. FRISBEE. Nobody can do that except the FAA.

Mr. BURTON. That's not too big a deal, is it?

Mr. FRISBEE. The analytical criteria to be used he cannot modify.

Mr. BURTON. Can or cannot?

Mr. FRISBEE. Cannot.

The major design philosophy affecting safety cannot change. He has to see that everything conforms to that.

All safety analyses have to be in accordance with the FAA. He has to see that they are, but he cannot dictate how they should be.

All test proposals he cannot approve.

He cannot approve major tests. He cannot be a witness for major tests. The FAA people must do that themselves.

For example, after TIA, the type inspection authorization, which is the authorization after which the FAA can go aboard the airplane and do the flight test work, it is the FAA people who get aboard. It is the FAA pilot who flies the airplane. It is the FAA observers who observe engine operation and system control operations.

So, after TIA, the FAA people themselves get aboard and not the DER.

All inservice safety problems are observed by FAA people and not the DER.

Aircraft flight manuals have to be approved by FAA and not the DER.

So, those authorities are withheld from a DER.

Ms. HALTERMAN. Mr. Chairman, it strikes me that if we are going to entertain thoughts of opening up the process, it ought to be for all of them. I don't believe ALPA offered to open up the pilot certification process.

Mr. BURTON. I do not know if they were talking about opening up——

Ms. HALTERMAN. I mean bringing in interested parties to participate.

Mr. BURTON. The DER is the employee representative of the industry. I think ALPA was talking about the advisory circulars and public hearings more than how the DER reaches his decision.

However, what applies to one in one area applies to all areas. I guess it is because of my own feeling about human nature—for whatever that is worth—that it seems there has to be some potential conflict for somebody who is on the payroll of a company to be in charge of seeing that the company is in compliance. In effect, he acts as the agent for the Federal Government when he is a company employee.

Ms. HALTERMAN. The medical examiner of, let's say, American Airlines is on the payroll. They seem analogous.

Mr. BURTON. I agree with that.

In certain areas there would be a difference. The United Airlines doctor worked for United Airlines and United Airlines is not going to make a dollar with a sick pilot, but I think we are in agreement.

To have somebody working for me to be the one who checks to see if I am doing the right thing is not a bad deal for me.

I guess the record indicates that in most instances the professionalism of the individuals involved supersedes the fear of offending the employer.

Mr. Butterworth?

Mr. BUTTERWORTH. How did you arrive at the progressive figures of 1,000 and 700 RVR? Were they given to you by the FAA. How was it decided that those are the visibility limitations you can fly the aircraft down to?

Mr. TAYLOR. It has not been decided. That was my opinion of a good step from our current RVR to the next step.

Mr. BUTTERWORTH. It states that in the advisory circulars.

Mr. TAYLOR. I believe what you are talking about is appendix No. 2.

Mr. BUTTERWORTH. Yes.

Mr. TAYLOR. I believe you will see that is a sample that the FAA has for an applicant, such as an airline.

Mr. BUTTERWORTH. It gives notice that the FAA intends to authorize use of that system eventually down to 700 feet. Is that right?

Mr. TAYLOR. Yes.

Mr. BUTTERWORTH. Where did they get that figure? Was it from you? Or did they dig it up themselves?

Mr. TAYLOR. I do not know. I think you ought to ask them. I do not know.

Mr. BUTTERWORTH. This may be repetitive. I would like to see a more detailed submission as to how you establish that the visual cues in 700 RVR are sufficient for the functions that the pilot would have to perform. I guess that is what ALPA is questioning. Their line is that the cues are basically insufficient for whatever function is demanded.

Mr. TAYLOR. Today's simulation of low-visibility weather is pretty good. It has not been until the last few years—in fact I do not think there are very many visual cue simulators in use today, such as the one we have—it is very realistic when you look at low-visibility conditions.

The problem is that weather is not very predictable. We can set in a simulator a ceiling of, let's say, 70 feet, 60 feet, 50 feet, and we can make runs on that. We can change the RVR's and selective units.

However, that is not exactly what the pilot is going to see. But, that is the best we have today.

Mr. BUTTERWORTH. Assuming it is best we have, it would be interesting to see on paper how you established that.

Mr. TAYLOR. It is more than paper. They are realistic simulations.

Mr. BUTTERWORTH. I realize that. I realize simulators can be as realistic as flying, but I am saying that your analysis on paper as to how that figure was determined would be interesting.

Mr. TAYLOR. We looked at them in the simulator.

Mr. HARR. Do you want him to give it to you?

Mr. BUTTERWORTH. Yes. Send it in.

[See app. 4.]

Mr. TAYLOR. I would like to comment on something that was said during the pilots' presentation this morning. I followed most of the discussion on their interest in looking at the data, and I was not at the meeting. Two of their people came. Mr. O'Brien was one. But he is right. There is an awful lot of data in certificating the category II ILS and the category III–A autoland. I think my interpretation is just slightly different.

There was no attempt on our part not to show them all they wanted to look at. I believe they had a constraint that they could not be available all the time, of course, because they fly. We did set aside a day, and I talked to each one of the three people before I came here. They are very knowledgeable people. Jim Gannet is a test pilot and accepted the invitation and asked for them to come out.

The head of the electromechanical unit and the head of the autopilot unit were there.

That data is very, very detailed. It is a detailed set of conditions to determine the suitability of the airplane. It takes a long time for a lot of engineers to look at it and understand it.

Mr. BURTON. That is the point that they were making.

Mr. TAYLOR. I appreciate that they were making that point, Mr. Chairman. There was not intent on our part to confine them to one day. If they wanted to stay longer, that would be fine with us.

I do not think that they spent very much time looking at the data. Most of the time was spent in talking about the conditions and whether they were appropriate. This is fine. We learn by doing that.

I am just pointing out that it is not the kind of thing that pilots are good at, that is, going through all that data. I do not blame them for not opening up the books and looking at all of that. It is pretty boring stuff.

What I am saying is this. We are attempting and trying to work with them.

The other point is this. I am glad that they are conservative. The system is not ready to go out this afternoon and fly at 700 RVR's. That is why I am suggesting that if you talk to the FAA, I think the approach of going from where we are today would be good. They have been using the autopilot for a good number of years, since 1968. That is when we first certified the autoland. That was down to 100 feet. There are 75,000 landings, but maybe that is not enough.

But at any rate, that is a pretty good background with no accidents—with zero accidents on autoland. That is a pretty good basis from which to move forward to go to the 1,000 RVR's. I think it is a good system, and I support the program.

Mr. BURTON. I would like to ask one question. The FAA issues a rule. According to your testimony it takes about 6 years to get it finalized.

Mr. TAYLOR. To get a type certificate.

Mr. HARR. Not for the rules, Mr. Chairman.

Mr. TAYLOR. To a certain set of rules already established, yes.

Mr. BURTON. I see.

The type certification comes from the advisory circulars?

Mr. TAYLOR. It comes from tests we do. It comes from analysis we do——

Mr. BURTON. How does it get down in A, B, C, and D's?

Mr. TAYLOR. In A, B, C, and D's?

Mr. BURTON. If it takes you 5 years of testing to come up to the standard of the rule of FAA——

Mr. TAYLOR. First of all, the 5 years is the time period from when we applied for the type certificate until we do all the necessary things to get the type certificate.

Mr. BURTON. What determines what the necessary things to do are?

Mr. TAYLOR. I see.

The FAA establishes a test plan, establishes the test that the contractor has to do, establishes the analysis that has to be submitted, such as a stress analysis.

Mr. BURTON. That is established in the rule?

Mr. TAYLOR. No.

Mr. BURTON. How is it established?

Mr. TAYLOR. It is established in a type board. There is a chairman headed up by an FAA man.

Mr. BURTON. By an official document?

Mr. TAYLOR. An official document transmitted to us.

Mr. BURTON. What is that document called?

Mr. TAYLOR. Test plan.

Mr. BURTON. I see. Please proceed.

Mr. TAYLOR. Through several series of meetings we deal with this. My chart shows this. They tell us what is required.

First of all, we are designing the airplane during the 5-year time. We are procuring materials. We are testing in the laboratory.

Mr. BURTON. When do they come with the advisory circulars?

Mr. TAYLOR. The advisory circulars may come at any time. The advisory circulars are—and there is a library of them now which apply to today's rules. I believe Mr. Butterworth has one up there on the autoland system.

It is a library of advisory circulars that are used by the aviation community to meet the rules.

Mr. BURTON. Is it a safe thing to go into the production stage without having the advisory circular?

Mr. DUBIL. There is an awful lot of confusion about what you are calling the advisory circular.

Mr. BURTON. The advisory circular is called an advisory circular. I am not talking about an advisory circular that says pilots can get discount rates at Hilton Hotels. I hope that everybody understands that, for the ninth time.

We have people talking about opening up the process. We are talking about the advisory circulars that the NTSB said are the nuts and bolts of the certification process.

I am trying to find out where in the pattern of your starting production these things come in? We have been told that if you open up the process with the hearings that the public will mess everything up. I was trying to figure out where these things fit in. I wonder if they are vital. If they are, maybe they ought to close the rulemaking process and open up this process.

Mr. TAYLOR. Mr. Chairman, I am not trying to be evasive at all. I am trying to stick to the issue. I think the NTSB testimony is inaccurate. I think the NTSB——

Mr. BURTON. Would you say that you hedged a bit?

Mr. TAYLOR. What they said about advisory circulars is inaccurate.

Mr. BURTON. How about what you said? I believe you said that you qualified it affirmatively—when Mr. Butterworth asked if certain advisory circulars weren't the most important documents that you get as far as certification is concerned.

Mr. TAYLOR. The most important document for certification is the Federal aviation regulation, part 25.

Mr. BURTON. The regulations are so vague that they have to send the circulars out to tell you how to meet the regulations. Right? If you disagree, that's OK.

Mr. TAYLOR. I think I disagree with you. I think the rules are pretty specific. The performance of the airplane after you lose an engine on takeoff has to be exactly what the rule says.

An aircraft circular might be issued to tell you how you go about flight testing and how much load factor you can pull to get off to the climb speed, but that is only to clarify. That is really what they are, to clarify in the minds of everyone who goes to certify an airplane——

Mr. BURTON. What you have to do to meet the rules. Isn't that right?

Mr. TAYLOR. Right. It also——

Mr. BURTON. It is very important, isn't it?

Mr. TAYLOR. That is right. That is the point I tried to make a while ago; that is, that a part of the time they say you can do it by computer analysis and part of the time you can do it by——

Mr. BURTON. That is the most favorable example for the point of your testimony. I can understand that. The point would be that this is a clarification. I would think that most people would agree that simulation and flight tests are equal.

On the other hand, would it not be nice for there to be some public input into FAA's determination that you do not have to flight-test but that you could use simulators. So then people can argue for the other side of the case.

In this one case the merits seem to be equal.

Mr. TAYLOR. I think the FAA does circulate circulars before they issue them in some instances. I do not believe it is mandatory. You had better ask them.

However, I do believe there is a practice to put out a preliminary advisory circular. We have commented on some.

I see no harm in that.

Mr. BURTON. That is the case that people are making. The advisory circulars, it is said, do really explain or define the general policy statement of the rule. It is said that they are therefore the definitive portion of the rule and should be subject to the same open process.

I guess Mr. Harr made these points. It was said that this could lead to more delay. It takes 6 years to get something certified, so I cannot see more than a 90-day delay. That would be a 30-day notice and 60 days for something else.

Mr. TAYLOR. One of the features of the circular is to get a uniformity in the industry. I think there was some criticism that one region might certify a certain set of conditions and a different region would do it differently. The advisory circular pretty well spells out the general policy statements. They would be fairly specific.

Mr. HARR. Mr. Chairman, I am worried that there is misconception being established here. I felt it from the time that Mr. Butterworth, in effect, asked Mr. Taylor about the importance of an advisory circular. I do not believe it is an operative document in the process anything to the degree to which it is seeming to emerge in this discussion.

I do not believe that it is an operative instrument in the certification process or an operative form of communication or an operative form of approval by the FAA during the certification process.

Now, I am not an expert, but I believe that to be true and I am afraid we have wandered off.

Mr. BURTON. The NTSB stated that. Some of these documents indicate that it has to be something. As I understand it, it tells you, in effect—let's put it this way. FAR 100 says that there has to be sufficient access for all passengers and flight personnel in the event that the tail falls off. The advisory circular will tell you to put doors here and there, and so on, which will open manually and electronically. Of course, I am oversimplifying it.

But, I do believe that they seem to have force in effect. They set the definition of what you have to do to meet the rule.

Mr. HARR. Is that true? I don't believe it is as simple as that.

Mr. BURTON. Mr. Dubil?

Mr. DUBIL. Let me make one statement, Mr. Chairman.

Up until a couple of weeks ago, I was of the impression that advisory circulars did go out for public comment.

If it is proposed that it be mandatory that they go out for comment, Douglas Aircraft Co. would have no objection. Further, I don't think anyone from the AIA would object if they were made public. If that is the crux of what the situation is, then I don't think we would worry about it.

Mr. BURTON. That is the issue. It has been raised. It is felt by some that the circulars are very important.

Mr. FRISBEE. Mr. Chairman, speaking from Lockheed's experience, the advisory circular is hard to understand because I think it has changed character over the years.

Originally, when the Federal airworthiness rules were made, they were general throughout. Many of the contractors did not know how to comply, so the FAA wrote a set of instructions sort of like the short form of the income tax. If you cannot understand tax laws, then the IRS tells you that here is a table and you can deduct so much for sales tax and so on. You can use the short form if you like, and it is OK. You don't have to use it. It is simply an easy way—an instant-coffee-type way—to comply with the income tax law.

Mr. BURTON. It lets you know that if you do these things you are in compliance.

Mr. FRISBEE. But if you are smart and know the tax rules and you are a lawyer, then you can go ahead and make all the deductions and use all the law to compute your deductions and find what your income tax is.

So, initially, advisory circulars were intended for people who had not even hired the engineers that could understand some of these technical things. They could follow the formula.

The original advisory circulars were really handy-dandy ways of complying with the rules.

There were not advisory circulars for every section of FAR 125. In fact, I would say that the percentage of the advisory circulars which tell you how to comply may be on the order of 10 percent.

The rule itself in many cases is extremely explicit. It tells you exactly what to do, and it tells you in many, many paragraphs. For example, in structural analysis it is very, very clear. They have supplemented the instructions where people had differences of opinion as to what a paragraph meant, so there was an advisory circular spelling out an interpretation. But, fundamentally, the advisory circular is an adjunct. It is not a part of the rule. It is a means for understanding the rule, and it is a handy-dandy way of complying. If you do not have the expertise or want to take the trouble to work out an equivalent safety analysis of your own, then you can use the circular.

So, I think fundamentally that puts a definition on what the advisory circular is. It is not the rule, but it is a way of meeting the rule.

Mr. BUTTERWORTH. Let me give you a couple of examples.

FAR 125 195(d) is that rule which allows you to get around the 15-percent wet runway distance requirement; is that right?

If you can demonstrate a landing on a wet runway, then you can get around that 15-percent dispatch rule.

Mr. TAYLOR. That is not a certification rule.

Mr. BUTTERWORTH. That is true. But the advisory circular tells the manufacturer how he is supposed to land his plane on a wet runway to get around the dispatch rule.

Mr. TAYLOR. I do not believe that is correct.

Mr. BUTTERWORTH. OK; then let's take another example.

Mr. FRISBEE. Let me give you an example of one of the early advisory circulars.

Mr. BUTTERWORTH. Excuse me. Let me give you another example: the engineering flight test guide for transport category aircraft. It is an FAA order 8110.8. The purpose of this apparently is to provide uniform guidance to the regions as they interpret FAR's. Here is a whole list of FAR's that have certain interpretations.

You turn to FAR 25.125—landing. It spells out exactly, or at least within reason, how those landing tests are to be performed. You are supposed to vary the weight and so on. You have torque pressure, manifold pressure, wing-flap position, scope of field, et cetera.

Mr. HARR. It does not tell me whether my airplane conforms to the rule.

Mr. BUTTERWORTH. It tells the FAA how to make sure it does conform.

Mr. HARR. But my point is that it is not certification in the sense that we have divided the two concepts distinguishing between rulemaking and certification. It does not tell me, the Boeing Co., or the Lockheed Co. that this airplane that I am trying to get type certificated obeys the rule. It does not come look at it. It does not test it. It does not read the data.

It just says, "This may be considered." It interprets the rule.

Mr. BUTTERWORTH. Yes; it interprets it. FAR 25.125 has five paragraphs in it. It must be five inches long. This has four pages. This is an order. It is not a circular. We have stated that there are certain FAA internal documents which interpret the FAR's, which are not part of the public rulemaking procedure.

Mr. HARR. There is no question about that.

Mr. TAYLOR. I think you ought to ask the FAA about that. That is an internal administrative document for the FAA.

Mr. BUTTERWORTH. I see.

Mr. BURTON. McDonnell-Douglas—does anybody object that those matters would have the possibility of public hearings?

Mr. DUBIL. On an advisory circular, I have no objection.

Mr. BURTON. Anybody else?

Mr. FRISBEE. No objection.

Mr. HARR. On anything like that, I do not think so.

I think two things are at issue here. One is the actual specific compliance required for a type certificate, and the second one would be what contribution would be made by some lay outside party that would justify delaying the process.

Mr. BURTON. What is wrong with a 60-day delay?

Mr. HARR. The process is long enough.

Mr. BURTON. I know that. So, if it is 6 years and 60 days, and if it provides a possibility of a little bit more safety, then what is the damage?

Mr. HARR. If there is any reasonable hope that it would provide safety, then we certainly would not differ with it.

Mr. BURTON. That would be the only basis for doing it.

Mr. HARR. That is true. We base our resistance to the concept on this: You have the pilots' input at any time. You have a million ways to get it. We don't ask to give input into the certification of pilots and mechanics or engineers, because that is not our business. Why should they be in on this?

Mr. BURTON. Because the pilots fly in the plane and their lives are at stake. The flight attendants are on the plane and their lives are at stake.

Mr. HARR. A lot of our people's lives are at stake. Our families are at stake and our livelihood's at stake.

Mr. BURTON. But these people work on the plane. That is their place of work. My family flies, and I fly, and I wouldn't show up at a certification hearing, but I do not think that it is too farfetched to hold that people that work on that plane and are flying in it every day, or every other day of their lives, shouldn't have some concern and shouldn't feel that they should have some input.

Mr. HARR. Absolutely.

Mr. BURTON. Who knows better than the flight attendants how a jump seat operates during landing and takeoff. You don't know. I don't know. They are the ones who sit in it.

Mr. HARR. Let's be clear so that I am not misunderstood. Any input that can contribute to safety should be allowed to be expressed.

Mr. BURTON. I agree. We are talking about those people engaged on the line. Maybe if these people had a little more input, then we would be better off.

They know how it operates. They can tell you that there is nothing better than practical experience. Someone who is a graduate engineer who may have also worked his way through engineering school as an airline mechanic knows the practical situation as well as the theory.

I get the impression that you do not want a bunch of busybodies sticking their noses into something that the industry knows about better. You may know best. I am not sure that the FAA knows best, however.

In fact, we have found in many instances that the industry had a better record than FAA.

Gentlemen, we are not as hostile as we sound, but we want to thank you for your testimony.

[Attachment to Mr. Harr's prepared statement follows:]

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THE CERTIFICATION PROCESS

(CHART 1)

There are three continuing phases for the certification of transport category airplanes. First, the establishment of the rules. Secondly, the determination that the airplane meets these rules. And thirdly, the continued airworthy operation of the airplane throughout its life in air carrier service.

(CHART 2)

PHASE I

The establishment of the rules is a continuous daily process, completely open to public scrutiny. All interested parties participate in the establishment of these rules which determine the level of safety for the traveling public in air carrier service. The rules apply to the design, manufacture, test, and operational use. The rules are not general in nature. In many instances the rules are very specific, to the point of requiring certain sizes and shapes for switches and the direction they operate; how many exits should be used; the level of performance that the airplane should have in normal and emergency operation; and the reliability of the systems, to name a few.

PHASE II

Moving to point two, the FAA has the responsibility to determine that a product meets the rules that have been established. In order to discharge this responsibility, the manufacturer must provide analyses, test and test results, mockups and simulations, and many other forms of data so that

PHASE II (Continued)

the Federal Aviation Agency can be assured of the safety of the product. Extensive flight testing is conducted by the FAA. The FAA uses the "designee system" to partially discharge that responsibility. The FAA uses designated engineering representatives (DER) to examine the myriad of details in the initial design, in the change activity, and in the operational use of the airplane. These designees must be demonstrably competent but have very strict limitations on how much of the process they can do. DER's do, in fact, accomplish the major percentage of routine approval activity related to FAA certification during the life time of the airplane. These DER's are limited in their area of responsibility and are under the check and surveillance of FAA personnel. The FAA retains approval authority for all significant aspects of certification, such as the regulatory basis for the certification, the analytical criteria to be used, the design philosophies that affect safety, all safety analyses, test proposals, and major flight testing. DER's are personally responsible for the accuracy of their work and their integrity is as important as their technical ability.

During the life of the airplane, constant improvement is sought. Thousands of changes are made to improve safety, improve operational reliability, and maintainability. Airplanes are changed by adding new models, higher gross weights, different engines, and other new equipment. Each of these changes must be examined to assure compliance with the rules. This is a daily process. Hundreds of changes are in the process continually. For example, since the type certificate was issued on the 747 airplane in December 1969, there have been 10,000 certifications. All these changes

PHASE II (Continued)

had to be properly scheduled so approval by the FAA could fit the complex manufacturing and delivery schedule.

Inference has been made that the DER system is somehow suspect and has contributed to a lack of integrity in the certification process as a whole. Nothing could be further from the truth. The designee system is used in all aspects of airplane, pilot, flight attendant, and mechanic certification. Yet only the use of DER's involved in airplane certification is questioned. DER's have an impeccable record of integrity. Safety is the overriding consideration for the FAA, the DER, and the manufacturer. Were it not for the reputation of being the safest airplanes in the world, U.S. certificated airplanes would not sell to the extent they have been and are being sold.

PHASE III

FAA regulations require that both the manufacturer and the operator of airplanes report service experience directly to the FAA. Service Bulletins are issued by the manufacturers in accordance with a strict specification administered by the Air Transport Association to alert or to advise the airlines of any changes for their particular airplanes. More on that subject later. Each one of the Service Bulletins issued by the manufacturer is screened by the FAA and whenever a change should be mandatory because of safety, the FAA issues an Airworthiness Directive. Another source of information to assure the safe design and operation of the air carrier fleet are the accident reports issued by the National Transportation Safety Board. The investigation of accidents in the U.S. is conducted by the NTSB and usually, the equipment manufacturers participate in that

PHASE III (Continued)

accident investigation to assist in the determination of its cause. This activity has provided valuable feedback information for the designers.

(CHART 3)

Now to the Service Bulletins and Airworthiness Directives.

Moving to the change activity, the upper left-hand of the chart shows the origin of a change to the initial type certificate. These are usually called production changes. These production changes flow two ways. First, they are introduced into the airplane on the production line after having been approved by the FAA. Each manufacturer has a retrofit review board which examines the changes that have been installed in production airplanes to determine their applicability to airplanes in service. You will note on the chart that there are three levels of Service Bulletins: the standard, alert and key. All routine matters are handled by standard bulletin.

The alert bulletin is used on all matters requiring the urgent attention of the operator and are limited to items affecting safety. The key bulletin is issued on matters requiring the key management of the airlines to be aware of the change. You will note that each one of these Service Bulletins are examined by the DER's and approval of the change is obtained before they are sent to the airlines. All of the bulletins are provided to the FAA. On those selected items that the FAA believes are of a safety nature which require immediate attention, an airworthiness directive is issued. This airworthiness directive goes by the fastest way possible to the airlines. In addition, the airworthiness directive is sent through diplomatic channels to foreign airlines. Customer support organizations of the manufacturer provide a telegraphic advisory to these same airlines to assure their timely delivery.

PHASE III (Continued)

I would like to make two points on this chart. The process is a daily one. Each manufacturer has several models of planes. There are several hundred certifications needing FAA approval daily. It would seem impractical at best to involve the public in this process.

The second point is that the manufacturer and the FAA makes extensive use of the DER's to handle these activities.

(CHART 4)

Now I wish to return to the "open" rule making process. The rules are established in open hearing process in which all interested parties participate. This is a continuing process. Any individual or organization can petition the FAA today to change the rules whenever they believe the rules do not afford an adequate level of safety. The rules governing design and manufacture are subject to constant review. None of these rule reviews take place in a vacuum, or as some would have us believe recently, in a dark, smoke-filled room. Anyone can petition to have a rule changed and all are free to comment on rules once they are proposed. The FAA has held three major rule reviews and many lesser reviews in the last four years. These reviews were attended by several hundred people, representing all segments of the industry, including ALPA, the public, foreign regulatory agencies, the airlines and the manufacturers. Naturally, if a rule change proposal is made which has no foundation or little data to substantiate it, it will get little attention in the FAA. However, if there is good foundation for the change, if the substantiation of the change is adequate, it must be acted upon by the FAA. The process is rulemaking. In this process, each interested party is given an opportunity to comment on the

PHASE III (Continued)

proposed change. Much public debate takes place in the process and much good information is made available. We believe that the safety rules for airplane design and operation are not static but a dynamic, changing, improving system as the safety record would indicate. And the current "open" process can be credited for this. On the other hand, we see no merit in opening the process further. Establishing rules is a logical cut off point for public participation. An analogy might be that law making is a public process, but administration of laws is left to competent experts. A nurse may be a qualified, highly-trained member of the medical community and may have observed many surgical operations, but when it comes time to have your appendix out, you turn to the doctor. When it comes time to certify the ability of the pilot, one does not turn to the manufacturer of the throttle. And, certainly, when it comes to final certification of a jet aircraft one does not turn to the public. Pilots, in particular, are intimately involved in aircraft certification.

By way of comment on the four specific issues which have been raised at this hearing, (Collision Avoidance System, Wet Runway Certification, 727-Autoland Certification, and CF6 Engine Certification) it is of interest to note that the question is not whether the product meets the rules. Specifically, the rules have been questioned. Taking as an example the wet runway question, this question has been debated in open public hearings since 1962 and the ALPA, along with those of other interested parties, have made their inputs known. The issue is not whether the airplanes in operation were certified to the existing rules, but whether it is in the public interest to change rules. The rules have not changed because there is not clear evidence

PHASE III (Continued)

that the accident record warrants a change and, furthermore, the technical community is unable to come up with an agreeable yardstick to measure the slickness of runways.

Suffice to say that opening up the process to public hearings would not have any impact on the four issues before the Committee.

No system is perfect, of course, which is why the FAA certification process is constantly under review. Accidents, a tragic though rare fact of life, are the source of much information and are constantly being analyzed for clues as to how design or operating practice could be improved. Quite simply, we are dealing here with a flexible evolutionary system of evaluating highly complex technologies.

(CHART 5)

Now let's take a look at the safety record which has been achieved by the worldwide air carriers. Chart 5 depicts the accidents that resulted in hull losses throughout the world commercial jet fleet.

As was pointed out by Mr. Harr in the opening statement, commercial air carrier travel is the safest form of transportation available today. The safety record has continually improved since the jet transport was introduced into service, and is continuing today.

The record is the best in history and is so because of the maturing of design and operation from service experience.

PHASE III (Continued)

Technology is continuing to provide better materials and systems; and the "open" participation in the rulemaking process has provided data that has resulted in better safety records.

Additionally, the safety record of that part of the system which is FAA approved is better than worldwide approved operations. U.S. built, FAA certified airplanes operated by U.S. carriers to FAA rules have produced a safety record two times better than other airplanes.

A close examination of these accidents will lead one to the conclusion that there are improvements to be made but none that would have been favorably impacted by a change to the certification process of airplanes.

FAA/U.S. Manufacturer Transport Category

Aircraft Certification Process

1. **Establish rules**

2. **Determine that aircraft meets the rules**

3. **In-service support**

FAA/U.S. Manufacturer Transport Category

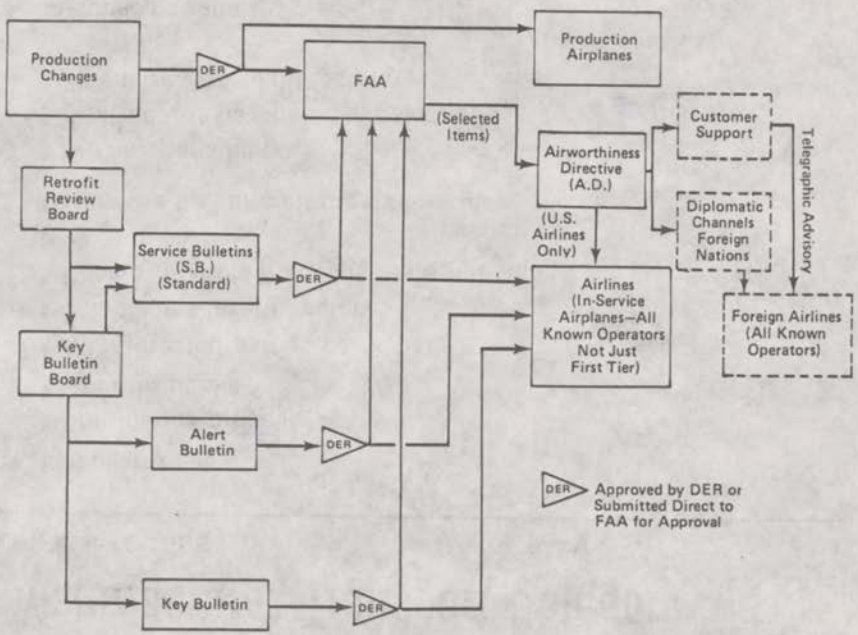
Aircraft Certification Process

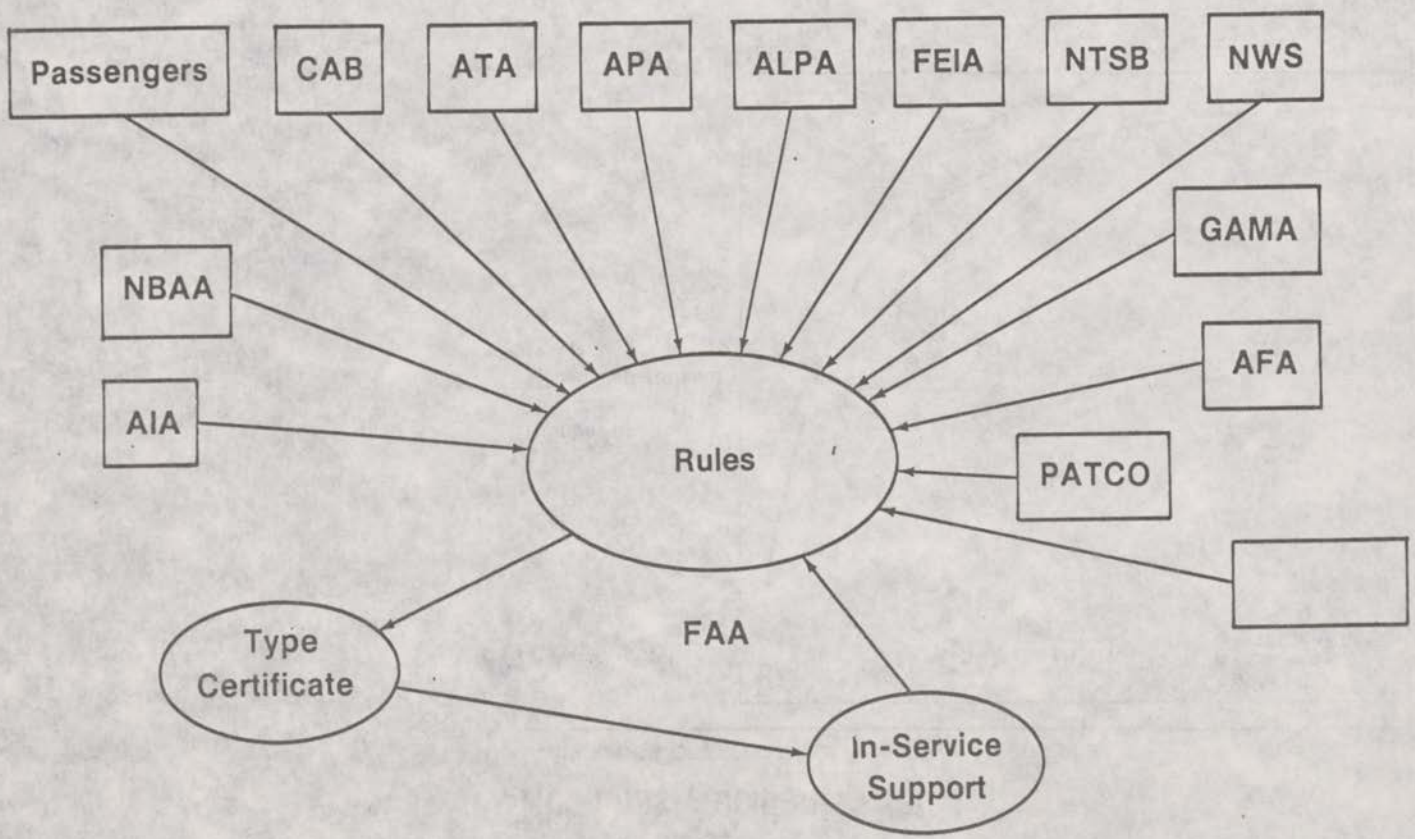
1. Establish rules
   - Continuous process
   - Open to public
   - All interested parties participate
   - Establishes level of safety
   - Design, manufacture, test, and operation

2. Determine that aircraft meets the rules
   - FAA responsibility
   - Analyses, tests, mockups, simulations
   - Extensive FAA flight testing

3. In-service support
   - Rules require manufacturer and operator to report directly to FAA
   - Service bulletins—manufacturers
   - Airworthiness directives—FAA
   - Accident reports—NTSB

Production Change, Service Bulletins, and Airworthiness Directives

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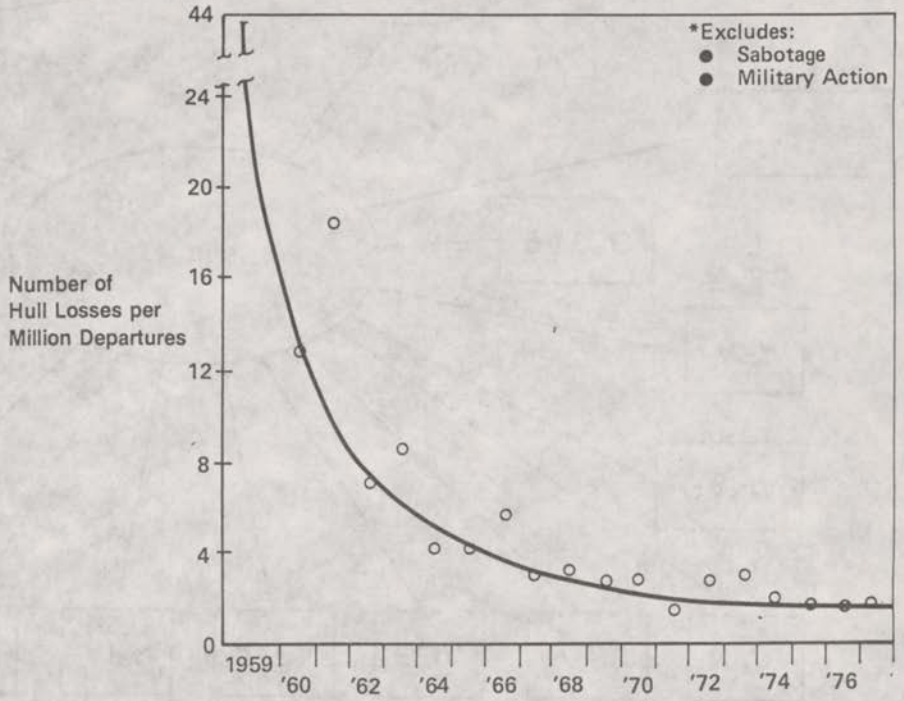
In-Service Support

Hull-Loss Accident * Rates

Worldwide Commercial Jet Fleet — All Operations



Mr. BURTON. We may have some questions in writing that we will send to you.

We will recess, and we will reconvene on Thursday in this room again at 9 a.m.

We will hear from representatives of the GAO, the FAA, the Air Transport Association, and the National Business Aircraft Association.

[Whereupon, at 4:35 p.m., the subcommittee adjourned, to reconvene at 9 a.m., Thursday, September 28, 1978.]

FAA CERTIFICATION PROCESS AND REGULATION OF ILLEGAL COMMERCIAL OPERATORS

THURSDAY, SEPTEMBER 28, 1978

HOUSE OF REPRESENTATIVES,
GOVERNMENT ACTIVITIES AND
TRANSPORTATION SUBCOMMITTEE
OF THE COMMITTEE ON GOVERNMENT OPERATIONS,
Washington D.C.

The subcommittee met, pursuant to notice, at 9:10 a.m., in room 2247, Rayburn House Office Building, Hon. John L. Burton (chairman of the subcommittee) presiding.

Present: Representatives John L. Burton, David W. Evans, Jack Hightower, and Robert S. Walker.

Also present: Representative Dante B. Fascell.

Staff present: Benjamin Palumbo, staff director; Bruce R. Butterworth, professional staff member; Cecelia Morton, clerk; and Rachel Halterman, minority professional staff, Committee on Government Operations.

Mr. BURTON. The Subcommittee on Government Activities and Transportation will come to order.

Today we will cover two subject matters. One will be the FAA's certification processes, and the FAA's failure to implement with some kind of collision avoidance system. We will also cover a problem known as Cockroach Corner down in Miami, which is really a generic term for ways of avoiding commercial safety regulations used by private operators of large aircraft. For example, businesses that somehow allow a passenger on an airplane not to be a passenger but perhaps a "guest" of a hotel, casino, or resort.

To open up today's testimony, we will hear from our distinguished colleague and member of the full committee, the Honorable Dante Fascell, who represents the area close to the Miami International Airport. He has done a great deal of work in the full committee in this area.

Yesterday or the day before, he introduced legislation that would mandate the FAA to do what they should have done a few years ago, that is, to come up with a collision avoidance system.

We always thought the FAA would follow congressional direction without a legislative mandate, but I am sure your legislation along with these hearings may prompt them even further.

We are delighted to have you here, Congressman Fascell. Please feel free to make your remarks.

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STATEMENT OF HON. DANTE B. FASCELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. FASCELL. Mr. Chairman and gentlemen of the subcommittee, I thank you very much for giving me the opportunity this morning to make a very brief statement at your hearings.

Let me first concur wholeheartedly with what you are doing. I commend you and thank you for your followup hearings on this very important subject. I know it can be said immediately that the air safety record in the United States is the best, that it is better than anywhere in the world, and travel by air is safer than other forms of public transportation.

The fact is that the tragic accident that happened at San Diego demonstrates once again that no matter how good we are, we must strive to do better. We have to do the best we can and never feel confident that we have done everything we can. That is the spirit in which I think this oversight hearing has to be taken.

The tragic loss of life, regardless of our safety record in this country, cannot be excused in any way.

As the chairman mentioned, I have introduced once again a bill that I introduced 11 years ago because of a tragic crash, a bill which mandates research and development of a collision avoidance system.

The FAA has the authority now to do that. But they evidently need a specific legislative mandate, and they certainly need the encouragement of Congress. I find it inconceivable that in this day and age we cannot find a "black box"—a piece of equipment—that will tell a pilot audibly and visually that another aircraft is within a predetermined danger zone.

I think the United States can develop technology to alert a pilot to the approach of an airplane, and do it at a reasonable cost to the aircraft owner.

I know that people say that it is a lot more complicated than that, and it may very well be. I am not sure that this equipment should be expensive or sophisticated. To start with, it may not be necessary to tell a pilot which direction the other airplane is approaching, how far away it is, what its altitude is, or how fast it's closing. But it ought to provide some type of warning, and at a reasonable cost so that the small aircraft owner is not forced out of the air.

Before the Aircraft Owners Association criticizes this proposal there is a very important caveat in this legislation, and I think it very well ought to be there. That is that whatever equipment is developed ought to be developed at a price low enough so that the individual aircraft owners can afford the protection. General aviation has made a tremendous contribution to this country and needs to be there. But, we all need to be protected from air collisions, and we have to take the lead, both in the Congress and the Executive, in doing something about it.

With respect to aircraft maintenance supervision and oversight, Mr. Chairman, I can't stress that too strongly. We need to improve regulation of safety conditions at Miami International Airport. Cockroach Corner is a bad enough name for what it really is. It may not be as bad there as it was, but since 1975 there have been a dozen cargo

plane accidents out of that airport in Miami. This figure is for leased cargo aircraft operating under part 91 of FAA regulations.

Just as recently as May of this year one plane slid off the end of the runway. Fortunately, no one was hurt or killed. However, the threat is there constantly.

If the planes have changed their base of operations, it really doesn't matter because they are flying from somewhere else. The whole question remains: Are FAA oversight and inspection systems doing the job in order to protect our people? There are a lot of aircraft flying in and out of south Florida and other places in this country on a leased-cargo concept under part 91 and, of course, purposely and properly not having to be required to maintain strict standards under part 121 that apply to certificated carriers.

Nevertheless, the problem is there.

I commend this committee for its study on this matter and for its continuing oversight. The chairman has one of the most sensitive public consciences I believe I have ever known, and all of you have the courage to speak out openly on what has to be done.

Therefore, I am confident that when you get through with your studies and these matters, that you will make recommendations that will help solve the entire problem, and you will see to it that they are carried out.

Thank you very much, Mr. Chairman.

Mr. BURTON. Thank you, Congressman Fascell.

[Mr. Fascell's prepared statement follows:]

PREPARED STATEMENT OF HON. DANTE B. FASCELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. Chairman and members of the Subcommittee, I appreciate your scheduling this hearing on the subject of FAA regulation of "dry-lease" operators in the Miami, Florida, area.

The recent disaster in San Diego, California, should serve notice that we still have a long way to go in assuring aviation safety in the United States. The threat of further air crashes should spur the Federal government, the aviation industry, and everyone else involved into renewed efforts to improve safety conditions.

In the Miami area, the greatest risk involves private cargo planes that too often are flown without regard to safety of equipment or proper training of crews. I would like to submit for the record an editorial from the Miami Herald of September 27, 1978, titled, "Cargo Planes Top Risk List of an Air Disaster in Miami".

The editorial points out that Miami has a special problem: ". . .The fleet of often poorly maintained, unscheduled cargo planes that fly mostly out of busy Miami International Airport. In the past few years, those so-called 'Part 91' operators have produced dozens of crashes and other mishaps around Miami and all over the Caribbean. Their cargoes have included everything from cattle

to Christmas trees, and some flights even carry explosives.

"For several years, local FAA officials let that situation simmer without moving forcefully to tighten controls. Lately, under increasing pressure, there has been more effort to regulate the fly-by-nighters and air cowboys who risk not only their lives but ours by flying anything with wings, no matter how rusty or ancient.

"It's never pleasant for an FAA official to deprive an air-cargo hauler of his certificate or to ground his pilot and thus deprive someone of his livelihood. But that's exactly what the South Florida public expects of the FAA, whenever it's warranted. The alternative is lost lives, both in the air and on the ground."

Mr. Chairman, I have been working for many years to improve safety conditions of these aircraft. Yet the airport section used by the carriers still deserves the nickname that has been applied to it: "Cockroach Corner."

The problem is not solvable simply by withdrawing certification. Some of the carriers involved have used many subterfuges to avoid coming under FAA regulation. By posing as "dry lease" carriers, they may operate under Part 91 of the Federal Aviation Regulations, rather than the far more stringent Part 121.

The FAA has generally held that a person leasing aircraft with crew services provided by him (dry lease) may operate the airplane under Part 91 -- the lessee is the operator. On the other

hand, if the lessor also provides the crew services (wet lease), the lessor is generally the operator and must, therefore, comply with Part 121, which is the same group of regulations followed by the large scheduled airlines.

To avoid coming under Part 121, operators have employed such practices as double contracting, deceptive cargo manifests, establishing dummy corporations concealing the owner, and registry of aircraft under a foreign flag. In the latter case, the operators then obtain CAB authorization to operate as a foreign air carrier.

The existing civil penalties have proven an insufficient deterrent. Accordingly, I hope that the Subcommittee will examine alternative solutions and recommend new safeguards that will solve this problem once and for all.

We should press for strengthened regulation by the FAA to assure that the private carriers at "Cockroach Corner" are as safe as all other carriers. I strongly support new safety requirements and urge that the Subcommittee lend its weight to achieve appropriate improvements in this important area of Federal responsibility.

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The Miami Herald

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6-A Wednesday, Sept. 27, 1978

EDITORIALS

Cargo Planes Top Risk List Of an Air Disaster in Miami

NEWS of a major air disaster like the Pacific Southwest Airlines crash in San Diego always has special meaning in Miami, a city that relies heavily on aviation for its economy and transportation links. Obviously, South Floridians feel the same horror as everyone else whenever there is violent, avoidable death.

But beyond that, any air disasters due in some part to congestion of the air lanes are inevitably a reminder for Miamians that it could also happen here. In fact, the odds of planes dropping out of the skies and onto residential neighborhoods are quite a bit better here than in San Diego.

This isn't just an exercise in Doomsday thinking. The densely populated coast from West Palm Beach to Homestead is one of the nation's most heavily traveled air corridors. It includes nine airports, compared with three in San Diego. Private planes, jumbo jets, military craft, and cargo planes all whirl daily over our heads in a ballet choreographed by the Federal Aviation Administration (FAA).

That kind of crowding calls for sophisticated and modern means of averting tragedies, and there is every indication that the FAA's methodology is doing the job. Despite the occasional, well-publicized crash of a scheduled airliner, travel by commercial jet remains just about the safest way of getting from here to there, statistically speaking. In 1976, the National Safety Council reports, there were 1.34 fatalities per 100 million car and taxi passenger miles. Compare that to 0.148 fatalities for general aviation (private planes) and just 0.005 deaths for regularly-scheduled airlines.

But Miami has a special problem: the fleet of often poorly maintained, unscheduled cargo planes that fly mostly out of busy Miami International Airport. In the past few years, those so-called "Part 91" operators have produced dozens of crashes and other mishaps around Miami and all over the Caribbean. Their cargoes have included everything from cattle to Christmas trees, and some flights even carry explosives.

For several years, local FAA officials let that situation simmer without moving forcefully to tighten controls. Lately, under increasing public pressure, there has been more effort to regulate the fly-by-nighters and air cowboys who risk not only their lives but ours by flying anything with wings, no matter how rusty or ancient.

It's never pleasant for an FAA official to deprive an air-cargo hauler of his certificate or to ground his pilot and thus deprive somebody of a livelihood. But that's exactly what the South Florida public expects of the FAA, whenever it's warranted. The alternative is lost lives, both in the air and on the ground.

Mr. BURTON. Before we hear from the new witness, I think it would be interesting to quote a report from this subcommittee on aircraft collision avoidance systems dated March 1972. It should be remembered that the reason FAA was formed was a mid-air collision. They were formed specifically to try to come up with an air collision avoidance system. To return, one of the quotes from the report is:

> The situation calls for a complete reappraisal of FAA's collision avoidance program, the days of "monitoring" must come to an end and collision avoidance development leadership must be retrieved from the Air Transport Association staff in Washington. Full and active meaningful participation must be allowed all members of the aviation community and the agency must overcome any bias favoring complete separation of aircraft or the use of ground air traffic control facilities.

In another section, it states,

> In a broader sense the FAA must recognize the need for implementing some level of collision avoidance capability to meet the needs of the seventies.

The 1970's are almost over and we certainly hope they do something to meet the needs of the 1980's.

Then, prophetically, the committee stated:

> Fate will not wait forever for FAA to deal effectively with collision avoidance problems.

I think recent events have tragically underscored that statement by this subcommittee that was made back on March 15, 1972.

At this time I would yield to my distinguished colleague and member of the subcommittee for any comments he might make, the gentleman from Texas, Mr. Hightower.

Mr. HIGHTOWER. I have no questions or comments at this time, Mr. Chairman.

Mr. BURTON. Thank you, Mr. Hightower.

The first witness will be Henry Eschwege from the General Accounting Office.

The witnesses for today will include the GAO, the FAA, the Air Transport Association, and then the National Business Aircraft Association.

Mr. Eschwege?

Will you please proceed?

STATEMENT OF HENRY ESCHWEGE, DIRECTOR, COMMUNITY AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE; ACCOMPANIED BY HUGH WESSINGER, ASSOCIATE DIRECTOR; AND GREGG FISHER, SUPERVISORY AUDITOR

Mr. ESCHWEGE. Thank you, Mr. Chairman. I would like to introduce my colleagues here this morning. On my left is Hugh Wessinger, the Associate Director of our Division, and on my right is Gregg Fisher who is the Supervisory Auditor in charge of our ongoing review of Federal Aviation Administration's enforcement of commercial safety regulations.

I have a prepared statement, Mr. Chairman, if you would like I can read portions of it and submit it all for the record. Or, if you prefer, I can read it all.

Mr. BURTON. I think that for a change we would like to have the entire statement read. There will be other statements that we will

accept for the record and ask to be summarized, but I think because of your investigation it makes more sense to have this read in its entirety so that the members of the subcommittee and the staff will fully understand the depth of your investigation and the problems we are faced with.

Mr. ESCHWEGE. Very well, Mr. Chairman, I will proceed with the statement.

We are here today at your request to discuss our ongoing review of the Federal Aviation Administration's enforcement of commercial safety regulations.

FAA reports that a number of owners or operators of large aircraft provide commercial transportation, for a charge, but are able to avoid commercial safety regulations and certificate requirements. We will address how commercial regulations are avoided, what the safety and economic implications are, how the Federal Aviation Administration has dealt with the problem, and what more needs to be done.

There are primarily three types of large aircraft operators—private operators, commercial operators who charge on a private contract basis, and common carriers such as scheduled air carriers.

We have provided an appendix with this information spelled out for the record.

Mr. BURTON. Without objection, this information will be inserted into the record at this point.

[The material follows:]

CATEGORIES OF LARGE AIRCRAFT OPERATORS

Private operators	Commercial operators	Common carriers
Comply only with pt. 91 private Federal Aviation Regulations.	Comply with designated sections of pt. 121 Commercial Aviation Regulations.	Comply with designated sections of pt. 121 Commercial Aviation Regulations.
Private carriage: Engaged in the carriage of own goods or passengers without charge.	Private carriage: Can have a limited number of contracts to carry cargo or passengers for a charge. Advertising or holding out to the public is not allowed.	Common carriage: Can advertise or hold out to the public and charge for transporting cargo or passengers.
No CAB authorization is required.	No CAB authorization is required.	CAB authorization is normally required.
No FAA operating certificate required.	FAA commercial operating certificate required.	FAA air carrier, or other appropriate operating certificate required.
About 3,000 large aircraft in the private aircraft fleet.	26 commercial operators use 144 aircraft.	About 90 common carriers use 2,500-plus aircraft.

Mr. ESCHWEGE. Large aircraft—over 12,500 pounds—used by private individuals or organizations must be maintained and operated in accordance with part 91 of the Federal Aviation Regulations. If compensation is received to transport passengers or cargo, the aircraft also must be maintained and operated under more stringent commercial regulations—Part 121 of the Federal Aviation Regulations. An FAA commercial operating certificate is also required. If the service is advertised or otherwise held out to the public as common carriage, the operator must obtain an appropriate FAA operating certificate, such as an air carrier certificate, and normally obtain Civil Aeronautics Board approval.

There are wide differences between private and commercial aircraft safety regulations for large aircraft, even though the same make and model of aircraft can be used for private or commercial purposes.

For example, under commercial regulations, there are specific requirements for a formal maintenance manual which must be followed, continuing maintenance and crew training, minimum staff and organizational requirements, overhaul of critical engine and airframe components, and crew duty time limits. Under private regulations, there are few such requirements. The cost difference of maintaining an aircraft under commercial rather than private regulations can be considerable. FAA officials believe that the incentive of higher profits through lower operating costs may lead some operators to avoid compliance with commercial regulations.

Some private large aircraft owners have avoided the certificate requirements and the commercial safety regulations by leasing rather than chartering aircraft to users. Generally, FAA has held that if the owner leases the aircraft without a flight crew, commonly referred to as dry leases, the lessee becomes the operator and is responsible for compliance with private safety regulations. If the owner leases the aircraft and provides the flight crew, otherwise known as wet leases or charters, the owner is the operator and must comply with commercial certificate and safety regulation requirements.

An owner that succeeds in making the lease look like a dry lease on paper, while actually providing the flight crew either directly or through a third party, may be successful in avoiding commercial safety regulations. It appears that lessees sometimes go along with this arrangement because of the lower cost, but in other cases they unknowingly accept operational control without understanding the attendant responsibilities and liabilities.

On October 2, 1970, a Martin 404 aircraft carrying 37 passengers crashed into a Colorado mountain, fatally injuring two crew members and 28 passengers of the Wichita State University football team. On October 20, 1977, a Convair 240 carrying 24 passengers crashed in Mississippi, fatally injuring two crew members and four members of the Lynyrd Skynyrd Band.

Although the National Transportation Safety Board did not determine them to be the direct cause of these accidents, the contractual arrangements and the misunderstandings or disagreements as to operational control are similar. Both aircraft were supposedly dry leased to the users, but the Board reported that apparently in neither case did the lessee know that he had responsibility for operational control over the aircraft and crew. Had these aircraft been chartered rather than leased, operational control would not have been transferred to the user, and the flights would have been commercial operations requiring more stringent safety measures. FAA took legal action in the first case and is now investigating the second one.

A less-used method of avoiding commercial safety regulations is employed when an aircraft owner or operator purchases cargo and then purports to be transporting his own goods while actually carrying a shipper's goods for resale to the shipper's customer at the destination.

Because it is often difficult and time-consuming to determine the true nature of such operations, FAA inspectors are sometimes unable to readily determine if commercial safety regulations should apply.

Another method of avoiding commercial regulations may involve certain foreign air carriers. FAA and Civil Aeronautics Board officials

in Miami suspect that some lease operators have agreements with Caribbean and South American foreign air carriers to permit the lease operator to dry lease aircraft to the foreign carrier on paper, but then continue to provide the crew and operate the aircraft under the foreign carrier's operating permit. FAA requires foreign air carriers using leased U.S.-registered aircraft in the United States to comply only with private safety regulations. In one case, a lease operator owned or controlled over 70 percent of the foreign air carrier's stock.

In other cases, foreign air carriers which legitimately dry lease and operate aircraft are able to use them in their U.S. operation while complying only with private safety regulations. At least one foreign carrier uses leased aircraft to fly passengers in competition with U.S. carriers.

Those suspected of unlawfully avoiding commercial regulations through leasing or other means are identified by FAA as uncertificated operators. While uncertificated operations are mainly cargo operations based primarily in southern Florida, they operate all over the United States. Most of the cargo is textiles, livestock, or produce destined for the Caribbean and Central America. There have been a number of passenger operations involving rock bands, church groups, and gambling patrons for casinos and hotels.

FAA officials identified about 90 suspected uncertificated operators in the Miami area, using nearly 150 aircraft. The aircraft range in size from the twin engine DC–3's to Boeing 707's and DC–8's. FAA does not know the actual extent of uncertificated operations. In some cases, they only become aware of such operations after an accident.

Typically, aircraft are bought when air carriers sell equipment which are sometimes due for costly major overhauls. These aircraft which are often beyond their economic life in air carrier service, can be used in private operations without extensive overhaul. If they are used by uncertificated operators, cargo and passengers can be transported at a lower cost, but not at the high level of safety afforded under commercial safety regulations.

Uncertificated operators pose a competitive threat to commercial operators who comply with commercial regulations. One commercial operator has stated in writing to FAA:

> If private aircraft operators are allowed or permitted to openly compete with the regulated commercial operator, then I am personally unable to justify in my own mind the costs associated with maintaining a commercial operator certificate.

This commercial operator singled out the higher maintenance and pilot training standards as factors leading to the cost competitive advantage of uncertificated operators.

FAA officials told us that uncertificated operators may be able to offer transportation at about half the cost charged by commercial operators.

Aside from a cost advantage, uncertificated operators may be operating unsafely in some cases. Since 1973, leased aircraft operated out of FAA's Miami area have been involved in 18 accidents. In some cases FAA has initiated investigations to determine if the operation was unlawful at the time of the accident. All were cargo carrying aircraft. Six were fatal accidents resulting in 122 fatalities. This in-

cludes one crash in a Miami residential area in which six persons on the ground were killed. and one crash in Bolivia in which 101 persons on the ground were killed. Seven accidents involved U.S. registered aircraft leased to a foreign air carrier at the time of the accident.

We made a comparison of accidents during takeoff or landing operations at Miami which showed that between 1972 and 1977, leased aircraft operated under private regulations were involved in five accidents, and commercial aircraft, including air carriers, also had five accidents.

Commercial aircraft during this time period, however, had almost three times as many takeoffs and landings. The accident rate for leased aircraft operated under private regulations in Miami, therefore, is almost three times as large. Moreover, the number of leased aircraft accidents may be increasing. During the first 6 months of 1978, leased aircraft operated out of the Miami area had six accidents, compared to three for all of 1977.

The causes of the accidents since 1973 are in doubt in some cases. We reviewed FAA and National Transportation Safety Board formal and informal documents, and conducted several interviews to learn what factors were proven or suspected to be relevant to the accident. The results are as follows: There were four accidents because of improperly loaded or restrained cargo. There were four accidents because of mechanical failure. There were four accidents because of crew error or fatigue. One accident involved improper maintenance. Another accident involved inadequate inspection. Four have not been determined.

It is difficult, if not impossible, to determine if any of these accidents could have been avoided by compliance with commercial safety regulations. In some cases private regulations were not complied with. Several FAA officials that we talked to, however, believe that better crew training, flight and duty time limits, better weight and balance and loading procedures, and formal maintenance programs—all part of commercial safety regulations—could have prevented some of the accidents.

Past attempts to protect uninformed lessees and enforce compliance with commercial safety regulations have not been totally successful. Regulations have been adopted requiring lessees to notify FAA when leases are executed and again before the first flight. In a number of cases, however, proper notifications are not being made, and FAA has not aggressively enforced the new regulations.

A truth-in-lending clause identifying the responsibilities of the parties to a lease has been made a required lease provision, and an educational circular on the hazards of leasing has been developed. These measures also have not been totally successful in preventing unknowledgeable lessees from accepting operational control.

Even when unlawful operations are uncovered and enforcement actions taken, FAA officials said leasing companies sometimes avoid injunctions or cease and desist orders by changing their names, locations, or both. Many can absorb as a cost of doing business the relatively small fines that are imposed.

FAA has proposed larger civil penalties because violations are subject to $1,000 per violation right now, and FAA officials said they need

either more priority and cooperation from U.S. Attorneys in prosecuting cases, or a delegation of civil prosecuting authority. FAA officials also cited a need for FAA inspectors to do a better job of developing the necessary facts to substantiate a case.

We noted a difference in enforcement of commercial regulations between FAA's regions. The southwest region appears to have more strongly enforced the use of commercial regulations on a day-to-day basis than the southern region.

One official in the southwest region said lease operators have complained that they cannot operate with the same freedom they have in the southern region.

The southern region did have some success, however, with a 1977 special program to enforce the use of commercial regulations. Six of 17 suspected operators that were thought to be reasonably active were investigated. Under threat of fines, three agreed to conduct future operations in compliance with commercial regulations. The other three ceased operations after being issued injunctions or cease and desist orders.

FAA officials said the special program was not continued, however, because of insufficient staff.

FAA officials in the southern region told us they have deemphasized the enforcement of commercial regulations and are instead trying to assure safety using private regulations only. A special transport unit has been established at Miami to monitor large aircraft operations. We learned the following through observations or discussions with FAA officials in Miami with regard to enforcement of private regulations.

Current staff levels prevent random checks to insure that required aircraft inspection programs are used, or airworthiness directives complied with. Airworthiness directives for a given aircraft model are often based on the aircraft's prior accidents and incidents and include actions such as a specific inspection or part changes.

Also, we learned that qualified staff is not available to conduct random flight crew proficiency evaluations. Required periodic flight evaluations are conducted by designated examiners who are not FAA employees. Unless FAA at least monitors some of these proficiency flights, they cannot be sure that designated examiners are doing their job properly.

Unlike its practice for commercially operated aircraft, FAA does not provide for routine inspection of operating—engines running—private large aircraft or its subsystems. Aircraft inspections are normally confined to aircraft while not in operation.

The National Transportation Safety Board has recently questioned the adequacy of private regulations to insure safe operation of large aircraft. Based on its analysis, the Board has called for a review and update of private regulations that relate to maintenance program requirements, leasing stipulations, flight crew qualifications, flight and duty time limitations, operational control, and weight and balance procedures.

The question then is: What needs to be done?

Our recommendations have not been finalized, but in addressing the problems discussed here, FAA appears to have at least two options. First, it can aggressively enforce existing regulations involving commercial operations. This would entail a concerted effort to identify,

investigate, and prosecute those who are improperly engaging in commercial operations. This would include close monitoring of those who operate under foreign air carrier permits. Rules involving lease notifications would have to be strictly enforced and lessees would have to be apprised of their responsibilities. Greater fines should be sought to act as deterrents. Those investigating violations should be adequately trained in what evidence is needed to substantiate a violation. Safety should improve if commercial regulations are strictly enforced, and all those actually engaged in commercial operations would be placed on a more equitable competitive basis.

A second option would entail placing all large aircraft operations under the same safety regulations. This would eliminate the need to determine how aircraft are being used before deciding which safety regulations should apply.

A variation of this option was proposed by a Department of Transportation Task Force formed in 1971 to study lease and charter operations. The task force report, known as the "Admiral Smith report," recommended that new regulations comparable to existing commercial regulations be developed for the maintenance and operation of all privately operated large aircraft. Once they have proven to be effective, the commercial operator designation would be eliminated and their operations would then be included under the new regulations. This would eliminate the competitive advantage of private lease operators over commercial operators.

In responding to the Admiral Smith report, FAA made some changes to tighten regulations pertaining to privately operated large aircraft, but FAA officials told us that the revised regulations fell far short of being comparable to commercial regulations. FAA is now considering another regulatory change which would more fully implement the Admiral Smith report recommendations. These changes would apply to all nonair carrier United States registered large aircraft.

Whatever course of action is selected, the regulations that are applicable must be strictly enforced. Checks must be made to determine if inspection programs and airworthiness directives are implemented. FAA should not totally rely on non-FAA flight evaluations, particularly in problem areas.

Finally, some FAA officials believe uncertificated operators may avoid stiffer regulation by moving their operations to a foreign country and then continue to operate in the United States under a foreign operating permit. FAA, in conjunction with the Civil Aeronautics Board, needs to address this possibility.

Mr. Chairman, we will be glad to respond to any questions you may have.

Mr. BURTON. Thank you very much.

The first question I have is this. The FAA has the Admiral Smith report. FAA made changes, but didn't the FAA say that the regulations seem to fall short of their mark and that now they are considering new regulations? Did they give you any idea why they didn't do the job properly at the start?

Mr. ESCHWEGE. No, they thought that by providing this truth-in-leasing provision early in the game that would overcome at least a

part of the problems. As we point out early in our statement, we still do not think that that has been fully enforced. We do not know why they did not do the full job.

Mr. BURTON. They themselves don't seem to think they did a complete job either. In your testimony you say that the officials told you that the regulations fall short of the mark and that they are now considering another regulatory change to implement the recommendations of the Admiral Smith report.

Mr. ESCHWEGE. We don't know what the changes will be.

Mr. BURTON. Or why they just didn't do it right the first time?

Mr. ESCHWEGE. No.

Mr. FISHER. I would like to add that some FAA officials we talked to believe at the time that it was a significant improvement but it has not evolved to be the improvement they thought it was.

Mr. BURTON. Things were so bad that anything would have been a significant improvement and still not have done the job.

Could you describe to the subcommittee the most important differences between rules for commercial and private operations of large aircraft? In other words, the differences between FAR part 121 and FAR part 91(d), particularly those relating to crew qualifications, flight time/duty time limitations, maintenance programs, weight and balance calculations, and cargo loading?

Mr. ESCHWEGE. Yes. There are several differences. For instance, in the crew qualifications area the pilot in command under commercial regulations is required to have an airline transport pilot's certificate, aircraft type rating, and first-class medical certificate.

Whereas under private regulations, the minimum pilot in command requirements include a private pilot's certificate, aircraft type rating, and a third-class medical certificate.

Also, just to give you some other examples under that, the proficiency of the pilot in command is normally evaluated every year in the type aircraft flown under commercial regulations. The proficiency of the pilot in command under private regulations is normally evaluated every 2 years in the type aircraft flown. Also, the pilot under the commercial regulations have an age limit up to 60 years of age. There are no age limitations under private regulations.

There are training programs for commercial pilots and crew. There are no continuing crew training programs for private regulations.

Now, as to flight time and duty time, there are prescribed maximum duty time and minimum rest periods for commercial regulations. In the case of private regulations, there are no flight time or duty time limits stipulated.

In the area of maintenance under commercial regulations, a formal program is required outlining maintenance procedures which must be followed. The mandatory operating specifications contain an extensive list of aircraft components which must be dismantled and overhauled at specified intervals. There are no formal maintenance programs required, and a very limited list of parts that must be replaced under private regulations.

Mechanics under both regulations must be properly certificated.

Completed maintenance work cannot be inspected under commercial operations by the mechanic who performed the work. There is no

such requirement under private regulations. Again, there are continuing maintenance training programs under commercial regulations and none under private regulations.

Lastly, under the category of weight and balance cargo loading, under commercial regulations procedures are required to be stipulated by the operator for maintaining the aircraft weight and center of gravity within approved limits and no procedures are required under private regulations.

Also required are cargo manifests showing maximum allowable weights and evidence that the aircraft is loaded within the center of gravity limits under commercial regulations, whereas under private regulations there are no manifests or weight calculations required but the pilot in command is responsible for assuring the aircraft is loaded properly.

You have quite a number of distinctions here between the two types of regulations.

Mr. BURTON. What is the difference in the two medical certifications? One is class A?

Mr. FISHER. There are different durations in how long they last. The first class only lasts 6 months and must be renewed. I do not know the duration of the third class. There are also different medical standards that apply to each as well.

Mr. BURTON. You wouldn't know what those standards are?

Mr. ESCHWEGE. No.

Mr. FISHER. We can find that out.

Mr. BURTON. Would you supply it for the record?

Without objection, the record will remain open at this point for the purpose of inserting this additional information upon receipt.

[The material follows:]

MEDICAL STANDARDS AND CERTIFICATION

There are differences in how often each type of medical certificate has to be renewed. These differences are listed in 14 CFR 61 (section 61.23). For example, operations requiring air transport pilot certificates require the pilot to have a first-class medical certificate which must be renewed every six months. Operations requiring a private pilot certificate require the pilot to have a third-class medical certificate which must be renewed every two years.

The different medical standards for the first, second, and third-class medical certificates are listed in 14 CFR 67. These standards stipulate minimum requirements under such categories as vision, hearing, mental and nuerologic, cardiovascular, and general medical condition. For example, a first-class medical certificate requires distant visual acuity of 20/20 or better in each eye separately, or at least 20/100 in each eye separately corrected to 20/20 with corrective lenses. A third-class medical certificate requires 20/50 in each eye separately; or if worse than 20/50 it must be correctable to 20/30 or better with corrective lenses. Hearing standards require the ability to hear a whispered voice at a distance of 20 feet for a first-class medical certificate, while the third-class certificate requires the same ability at three feet. For a complete list of the different medical standards see 14 CFR section 67.13, 67.15 and 67.17.

Mr. BURTON. To what extent can you relate these differences to the higher accident rate suffered by the lease operators?

Mr. ESCHWEGE. Actually it is very difficult, if not impossible, to determine if these accidents that we talked about would definitely have been prevented if these operators had complied with commercial regulations. We can only point out that under most of the factors

listed in our statement, there are stricter provisions of controls under commercial regulations. It should be noted that some of the accidents involved noncompliance with private regulations.

I can give you a little wider viewpoint. I would draw your attention to the recent Transportation Safety Board recommendations mentioned in my statement. The Board analyzed 65 accidents of privately operated large aircraft and found that the maintenance of the aircraft was a cause or a factor in 46 percent of the accidents. The Board found this percentage to be extremely high when compared with other categories of operation.

The Board in a wider sense is concerned about the lack of maintenance on some of these aircraft.

Mr. BURTON. In the regulations the FAA sets the standards and requires programs and documentation that give it the ability to observe operations, and the tools to do something when an unsafe condition is found. In this respect, how does part 121 differ from part 91(d)?

Mr. ESCHWEGE. There are certain additional requirements under commercial regulations which are not present under private regulations. Commercial operators are required to periodically furnish financial statements. FAA needs this information to determine if the applicant has sufficient financial resources to conduct a safe operation.

Also, commercial operators, unlike private operators, must identify that management personnel meet certain qualifications and have duties assigned.

Also, company manuals are required that stipulate such items as flight crew and ground personnel duties, emergency equipment and procedures, et cetera.

Records are required to be kept on the airplane under commercial regulations showing what critical components are in need of repair.

Finally, and most importantly, FAA inspectors are authorized to ride on the aircraft to monitor crew proficiency and the airworthiness of the aircraft—that is under commercial regulations. FAA's air carrier operations inspector's handbook states that the agency's en route inspection program provides an excellent evaluation of the operator's total effort.

These provisions are not in the part 91 regulations.

Mr. BURTON. Does the FAA have authority to enter these planes at will under part 91(d)?

Mr. ESCHWEGE. We think they have a legal authority.

Mr. BURTON. They should have some moral authority, I think.

Mr. ESCHWEGE. FAA does believe it has authority under section 609 of the Federal Aviation Act to adopt some of the regulations as it has for commercial airlines with respect to privately operated large aircraft. But their regulations right now do not provide for it. They say they are presently studying whether this is a necessary or desirable procedure to be followed with respect to private aircraft operations.

We feel that FAA inspections of privately operated large aircraft should be similar to those of commercially operated aircraft.

Mr. BURTON. In other words, they have the authority to make the regulations, but they question whether or not it is necessary or desirable. Are they privy to the same information you are about the accidents and fatalities?

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Mr. ESCHWEGE. Obviously, yes. Most of the information we have comes from their files.

Mr. BURTON. But they still have a question as to whether or not it is desirable or necessary?

Mr. ESCHWEGE. I think they have a number of questions. They can speak for themselves, but one is the additional staff it might take or whether it would take away staff from commercial operations and whether or not they could do justice to both at the same time.

Mr. BURTON. A life is a life, usually.

I have one other question before I yield to my colleagues.

Perhaps this would be better to ask FAA, but why is there a difference in enforcement between regions? In other words, in the Southwest region, which I assume contains that great State of Texas, the FAA people were a little stricter in dealing with these operations, whereas in Miami, the same people working for the same agency and paid by the same taxpayers do it a little differently. Do you have any insight on that?

Mr. ESCHWEGE. Yes, I would say that in the Miami area you would find the hub of the operation. There are a lot more takeoffs from there. I think it gets down partly to a staff problem whereas in the Southwest area, they do not have as many operations so that maybe their staff can adequately deal with it. Mr. Fisher, would you want to add something to that?

Mr. FISHER. Yes. I think that is basically correct. The sheer magnitude of the problem in the Miami area has convinced FAA that they have to assure safety under private regulations first and then, as time permits, get these unlawful operators under commercial regulations in a legal process.

Mr. BURTON. It doesn't make any sense to me.

Mr. Walker?

Mr. WALKER. Thank you, Mr. Chairman.

I would like to start off with a comment. I think from watching some of the TV news recently about what some of those unlawful operators are doing in Miami, the Bureau of the Customs have some suspicions.

One of the things you say in your testimony is that one of the options available to FAA is aggressively enforcing regulations involving commercial operations. Earlier in your statement you had made the point that when they did that, they had investigated six of 17 suspected operations and of that number, half of them, if I understand you correctly, ceased operations after being issued injunctions or cease-and-desist orders. In other words, once they honed in on the problem, they were relatively successful with that kind of operation. Then you say that, because of insufficient staff, the program was not continued.

Mr. ESCHWEGE. That is correct.

Mr. WALKER. My question is this: Did you get any indication along the way as to what could possibly be more important to FAA than the business of protecting life, and limb, and avoiding collisions in the air?

From the entire record in your testimony, I get the idea that you have identified a severe problem here in terms of collisions. Yet, when we get down here on the bottom line and one of the main options open to them, that they can exercise now, they are evidently saying they are not going to continue because of insufficient staff. Have you any idea at all what priority could be greater than this?

Mr. ESCHWEGE. It is puzzling to us, too. We will pursue it further as we complete this review.

In my own mind, I have great difficulty not applying a lot of these regulations to both private operations as well as commercial operations.

Mr. WALKER. A little earlier in your statement, you made the point that the FAA has proposed taking some actions including larger civil penalties when they find unlawful operations. You also say that the FAA officials cited a need for FAA officials to do a better job in developing the necessary facts to substantiate a case.

Isn't that something they could do immediately? Aren't these people under their jurisdiction? Does that need you to go in and study for them to begin to implement that? If they see that need, why isn't it being done?

Mr. ESCHWEGE. I can only agree with you.

Mr. WALKER. OK.

Also you say that the FAA officials that you talked to believed that better crew training, flight and duty time limits, better weight and balance alerting procedures, and formal maintenance programs could have prevented some of the accidents. Is there any indication as to why, if they see that, it is not being done?

Mr. ESCHWEGE. Well, the rulemaking is a very slow process. As we pointed out, they are now reappraising their rules and are hoping to come up with some further requirements. However, this won't happen until January of next year, I believe.

Mr. WALKER. I thank you for your testimony. I think you present us with a very disturbing record here which builds on things we have been learning throughout these hearings. I, for one, certainly appreciate having this as a part of the record of this hearing.

Thank you, Mr. Chairman.

Mr. BURTON. Mr. Hightower?

Mr. HIGHTOWER. Mr. Eschwege, how many regions are there in the FAA areas?

Mr. ESCHWEGE. There are nine regions.

Mr. HIGHTOWER. Were your investigators in all nine regions?

Mr. ESCHWEGE. No. Mr. Hightower, as you know, this review is not completed. So far we have been in two regions, the southwest area and the southeast.

Mr. HIGHTOWER. Why were these two regions chosen first? Was there any particular reason?

Mr. ESCHWEGE. Yes. As we heard earlier, the preponderance of operations of these dry-leasing arrangements are in the southeast area and there are some in the southwest area. We wanted to compare them.

Mr. HIGHTOWER. There would not be a comparable situation in the northeast area?

Mr. ESCHWEGE. We understand there are some, but we have not looked at those.

Mr. HIGHTOWER. I see.

Is it your plan to go ahead with the other regions and make similar surveys there?

Mr. FISHER. While we have evidence that this type of activity does take place in other regions, it is apparently minor in comparison to

the southern and southwest regions. I think we have learned as much as we can learn from visiting those two regions where the preponderance of the operations are taking place.

Mr. HIGHTOWER. In other words, your investigation was to center on the uncertificated large aircraft operations?

Mr. ESCHWEGE. Yes; and to compare the regulations. I think we have enough evidence to point to the fact that private regulations are not as stringent and need some tightening up.

Mr. HIGHTOWER. It was not part of your goal as you made the investigation, although it was a side result, to determine the enforcement in the different areas?

Mr. ESCHWEGE. Oh, yes. We did want to check on the enforcement but we were only looking for examples without trying to single out any particular operator of those leased operations.

Mr. HIGHTOWER. I see.

The complaint of FAA that they had insufficient staff to continue this enforcement was just in the southern region?

Mr. ESCHWEGE. That is correct.

Mr. HIGHTOWER. Could you elaborate any more on that? As I heard your statement, and I am reading it from page 10, I understand that they had a crackdown time when they had 6 of 17 suspected operators thought to be reasonably active who were investigated. Was this in response to any special orders out of Washington? Was there any particular motive for this?

Mr. FISHER. I think FAA came to the realization that something was needed to specifically address lease operators, rather than whether they met part 91 safety regulations or part 121 commercial regulations. This was a special program. Some of the staff that was used was borrowed staff from the Washington office and maybe elsewhere.

When the six investigations were concluded, the staff was disbanded.

The person in charge of the special program told us that he feels that there is a continuing need for something like this—some type of continuing investigation—whether it be on his behalf or whether it be at Miami itself.

This particular investigation was headed up by the Southern Regional Council of the FAA.

Mr. HIGHTOWER. I see.

I have no further questions, Mr. Chairman.

Mr. BURTON. Mr. Fascell?

Mr. FASCELL. Thank you, Mr. Chairman. I gather there is a different classification for private aircraft under 12,500 pounds?

Mr. ESCHWEGE. Yes; there is.

Mr. FASCELL. Is the classification also for both cargo and passenger aircraft?

Mr. ESCHWEGE. The classification applies to cargo and persons below 12,500.

Mr. FASCELL. In other words, an aircraft under 12,500 pounds can carry cargo and persons for hire?

Mr. FISHER. No; not for hire. For hire operations under 12,500—that would come under part 135.

Mr. FASCELL. That is another classification?

Mr. FISHER. Yes.

Mr. FASCELL. Small aircraft come under part 135 if they are going to haul cargo or persons for hire?

Mr. FISHER. That is correct.

Mr. FASCELL. And the others under a different classification. For 12,500 and above they are under part 91(d) if they haul cargo and persons for hire?

Mr. FISHER. No. All turbine-powered aircraft and all aircraft over 12,500 come under 91(d).

Mr. FASCELL. Regardless of whether they are for hire or not?

Mr. FISHER. If they are compensated, they are supposed to be under the applicable portions of 121, and have a certificate.

Mr. BURTON. Will you yield for a second?

Mr. FASCELL. Certainly.

Mr. BURTON. What if they run into one of these lease arrangements where the aircraft operator is really being compensated. He just leases the aircraft to a casino or a hotel out in the Caribbean somewhere, and the passengers become "guests" of the casino or the hotel and are not carried for the compensation of the aircraft operator?

Mr. ESCHWEGE. If the plane is leased without the crew, and the crew is provided by the casino, for instance, it comes under 91(d).

Mr. FISHER. If they don't charge those passengers.

Mr. ESCHWEGE. If it is not a charter flight, in other words.

Mr. BURTON. OK.

That casino or hotel could lease a crew from a corporation that provides crews for hire. Is that right?

Mr. FISHER. Yes.

Mr. BURTON. They could have an interlocking relationship with the corporation that operates the airplane. Is that right?

Mr. FISHER. What happens in those cases is that there is a relationship between the person providing the aircraft and the person providing the crew. In many cases it is the same person.

Mr. BURTON. Although they are different corporations?

Mr. FISHER. They may be under different corporations.

Mr. BURTON. That allows them to avoid the more stringent section of safety regulations.

Mr. FISHER. Yes. It gives the appearance of a dry lease when it is actually a wet lease. The operational control rests with the aircraft owner. Each of these cases has to be considered on an ad hoc basis.

Mr. BURTON. Would this allow me to own Burton Plane Corp. and John Crew Corp. and evade most of the safety regulations by leasing the plane and the crew to X hotel, and letting the people fly at their own peril?

Mr. ESCHWEGE. What we are saying is that they do make it look like that at times. On occasion the hotel does not even know that it is supposed to have the operational control over that airplane and does not know what its liability is.

Mr. BURTON. Thank you.

Please go ahead.

Mr. FASCELL. I thank the chairman. That is where I was going with part of this question.

The other part is this. I gather that part of the Admiral Smith report thrust was that there really should not be any distinction. They are still

airplanes and they are still carrying people, whether the lease is wet or dry, or they operate under 121 or 91(d). It really does not make any difference. That seems to be the basic thrust of this thing.

Did you gentlemen get an opportunity to review the rationale of 91(d), or are you writing strictly on the Smith report?

Mr. ESCHWEGE. No. We looked at 91(d), independently. We have great difficulty finding the rationale in those areas where, as I cited earlier, maintenance requirements differ for the same planes. Crew requirements differ for the same type of aircraft. We are still dealing with lives.

Mr. FASCELL. In carrying either cargo or personnel.

Mr. ESCHWEGE. That is right. And we also should not forget the people on the ground. As we saw again recently in the San Diego situation, it affects the people on the ground, and they get killed as well.

Mr. FASCELL. You made the statement in your testimony that the FAA does not know the actual extent of uncertificated operations. Did you ask why?

Mr. ESCHWEGE. I think it gets back partly to staffing. There is a way of finding out if you delve into it. They did do that for awhile in the southern region, as you know. However, they have not maintained that kind of surveillance. Because of these intricate relationships the gentleman was mentioning, it is difficult to see it unless you get into all of these detailed arrangements. That takes time.

Mr. FASCELL. I gather from your testimony that the greatest amount of the operation is out of the south Florida area. Am I correct?

Mr. ESCHWEGE. Yes.

Mr. FASCELL. One of the reasons attributed to lack of followup was lack of staff.

Mr. ESCHWEGE. That is right.

Mr. FASCELL. Do you have any evidence that staff was pulled in from any other regions where flights are not as heavy for any specific period of time of operations?

Mr. ESCHWEGE. The one we know of is where they did pull in and borrow staff to make this, I believe it was, 3-week investigation of the limited number of aircraft operators whom they suspected were illegally operating.

Mr. FISHER. In addition, the FAA has established a large aircraft transport unit in Miami for the specific purpose of looking after these large aircraft.

Mr. ESCHWEGE. That is to enforce the private regulations. What we are saying is that for a while they were looking to see whether commercial regulations should apply and to do that you have to get into all of these arrangements that I mentioned to make sure that there is not some evasion of the commercial regulations.

Mr. FASCELL. Over what period of time did your study take place?

Mr. ESCHWEGE. It is still going on, sir. It started around May or June—no, it was June 1978. We are still working on it. We agreed to come and tell you today what we know so far.

Mr. FASCELL. And the recommendations you have made in your statement—are those interim recommendations?

Mr. ESCHWEGE. They are interim. They are the options available as we see it. There are basically two options.

Mr. FASCELL. Has GAO decided yet what option they are going to recommend?

Mr. ESCHWEGE. The GAO has not, but if you would like to know my personal opinion, I can give you that.

Mr. FASCELL. I would be delighted to have it.

Mr. ESCHWEGE. My personal opinion would be that it is the second option. That is, there would be a cost associated with this second option because what we would be saying is the same regulations pretty much apply to all aircraft of similar weight and so on and so forth. An advantage of this would be that any tightening of private regulations could easily be made applicable to foreign operators, as well. That is a problem, too, because they are now under private regulations and if we did away with the distinction at least in these critical safety areas, then all of them would have to follow the same regulations.

The main thing is still that there be enforcement; providing regulations is not adequate unless they are strictly enforced. We know that some of the private regulations, even now, are not strictly enforced.

Mr. FASCELL. Thank you very much.

Thank you, Mr. Chairman.

Mr. BURTON. You talked about foreign operations. This is not unlike what we found in oil tanker safety where there are three or four foreign flags which are flags of convenience. We found that the Coast Guard, under the Department of Transportation, although they have not done as much as we would like to see them do, seem to be moving more aggressively toward holding foreign-flag vessels to certain U.S. safety standards.

Is there any question that the FAA could do that with foreign airplanes that are landing on American soil?

Mr. ESCHWEGE. If the second option were adopted, I think there could be some tightening up. Right now, these operators or so-called operators are only subject to parts of 91(d). Of course, there are some international agreements, as I understand it, under which they are also subject.

Mr. FISHER. There is a distinction here between U.S.-registered airplanes that have to comply with part 91 and foreign-registered airplanes operated by foreign operators and what we can require of them. FAA has told us we can require a lot more than we do of foreign operators, particularly when they use our airplanes.

As it stands right now they only have to comply with part 91 and the inspection program, when they use U.S.-registered airplanes.

Mr. BURTON. They said they can require it. Do they ever say why they don't?

Mr. FISHER. No; they didn't.

Mr. BURTON. Mr. Evans, do you have any questions?

Mr. EVANS. Not at this time, Mr. Chairman.

Mr. BURTON. Mr. Butterworth?

Mr. BUTTERWORTH. Mr. Fisher, if I understand you correctly, there is one additional step that could be taken by an illegal commercial operator in using a foreign civil aviation authority as a flag of convenience. That would be to reregister U.S.-registered aircraft in a foreign country and to get that foreign civil aviation authority to issue

the required airworthiness certificates. What handle does the FAA then have on those aircraft?

Mr. FISHER. Foreign operators and foreign-registered airplanes are not under the strict control that FAA exercises or could exercise over U.S.-registered airplanes. There is less the United States could do.

Mr. BUTTERWORTH. Has this been done yet?

Mr. FISHER. I am not aware of any cases where it has been done. FAA officials that we talked to believe that it could be done if part 91 is tightened and enforced significantly.

Mr. BUTTERWORTH. In your investigation in the Miami area, did you have a chance to observe or obtain any information on the FAA's ability or apparent inability to stop an unsafe act?

Mr. ESCHWEGE. Yes, we did come across something that might be of interest.

In this case, FAA officials told us if during their routine surveillance they find an aircraft that is unairworthy, they can notify the operator that the defects must be corrected prior to flight. If the operator disregards FAA's notice and operates the aircraft, FAA can then take enforcement actions which may involve civil penalties and suspension of the certificate, and seizure of the aircraft.

But they did tell us about one recent occurrence where they warned the pilot not to take off because of a fuel leak that was evident. The pilot ignored the warning and under the circumstances, FAA was unable to take the timely action to prevent the takeoff. Subsequently, FAA did revoke the aircraft's airworthiness certificate.

But the point is, they warned the aircraft, and the plane still took off.

Mr. BUTTERWORTH. Does FAA have the power to park a car in front of an aircraft and pull that pilot out, or enter the aircraft, or take any action of that sort?

Mr. ESCHWEGE. Except in the situation where FAA has time to obtain a temporary restraining order——

Mr. BUTTERWORTH. How long does that take?

Mr. ESCHWEGE. It takes too long. I don't know how long. There is little they can do to prevent the pilots from, in effect, violating the regulations.

Mr. FASCELL. Will the counsel kindly yield at that point?

Mr. BUTTERWORTH. Certainly.

Mr. FASCELL. Mr. Chairman, I am a little amazed here. You mean that in this particular instance the certificate of the aircraft was lifted; is that correct?

Mr. ESCHWEGE. After the fact.

Mr. FASCELL. What happened to the pilot?

Mr. ESCHWEGE. There was also a pilot violation brought against the pilot.

Mr. FASCELL. What happened to him?

Mr. FISHER. He landed safely. There was no accident.

Mr. FASCELL. What happened to his ability to fly airplanes?

Mr. FISHER. As far as we know——

Mr. FASCELL. You did make the statement that the pilot, notwithstanding the direct order, flew anyway? Is that right?

Mr. FISHER. That is correct. There were violations processed against the pilot.

Mr. FASCELL. What does that mean? Did he get a slap on the wrist and a $100 fine and fly another airplane?

Mr. FISHER. As of 3 days ago, the case had not yet been decided.

Mr. FASCELL. Let's advise everybody not to fly with that pilot or get on that airplane. That's another way around it. It is unbelievable.

Mr. BURTON. Please continue.

Mr. BUTTERWORTH. What did you find wrong with the FAA's reliance on the private pilot proficiency examiners? I am going to take a leap here. I understand that when your investigators were down in Miami they found that one of those examiners just happened to be a suspected illegal operator.

Mr. ESCHWEGE. That is correct. Certain non-FAA proficiency pilot examiners are authorized by FAA to administer this proficiency flight evaluation. Of course, FAA inspectors could also do it, but we don't think it is a good idea to place total reliance on these proficiency pilot examiners. There needs to be some surveillance because it is a very important function and we have another quote here from the southern region report which points out, and I quote:

> It has been noted that checks have been given from one point to another and the time log was minimum time involved for a normal flight between these points. There could not have been any maneuvering, multiple approaches, or missed approaches required.

In other words, this is where the private pilot did the proficiency flight evaluation.

As you pointed out, there was this one instance where the pilot who administered these evaluations was involved in an aircraft accident. We brought it to FAA's attention because he was continuing to give evaluations and, of course, once we did that, they did withdraw his authorization to administer evaluations.

Mr. BUTTERWORTH. So there has to be something wrong with a system of "spotchecks" if they allow an illegal operator to give an exam.

Mr. ESCHWEGE. I think the Government cannot completely relinquish its responsibility. It needs to have some supervision just like it is supposed to have over other contractual relationships.

Mr. BUTTERWORTH. I have one final question.

We have been through all the limitations of 91(d) and the apparent advisability of upgrading it. Nevertheless, you still outline some things which the FAA could be doing right now within the confines of the present 91(d).

As I understand it, one of the most important things that could be done is to be on the aircraft during its engine runup. By requesting permission to get on the aircraft before it takes off—and I presume they would want to get off before it takes off—and by observing the aircraft to that extent, what would this tell you about that particular operation?

Mr. FISHER. Under existing regulations, an FAA inspector can request to get on the airplane and ride out to the end of the runway. He could learn a great deal.

Under private safety regulations, depending on the type of aircraft and the planned operation, the aircraft owners or operators are required to have certain operable equipment on board the aircraft. For example, this includes air speed indicator, altimeter, engine instru-

ments, landing gear position indicator, navigational equipment, radio equipment, and electrical generating capacity.

In addition, even private regulations stipulate that repairs to the aircraft, the airplane, the aircraft engine, and so on will be at least equal to its original or properly altered condition.

Unless FAA surveillance includes at least random examination of such equipment while it is in operation, there is no way FAA can be sure that complete compliance is made with the regulations.

Mr. BUTTERWORTH. So there is no better way to tell whether important equipment is running well than to check it when it is actually running.

Mr. FISHER. That is correct.

Mr. BUTTERWORTH. But right now you have to request permission to get on board?

Mr. FISHER. That is correct under present regulations.

Mr. BUTTERWORTH. That is permissible, yet FAA does not have a random program to do just that?

Mr. ESCHWEGE. The regulations do not provide for it although the law allows it.

Mr. BUTTERWORTH. They can still request permission?

Mr. FISHER. They can request permission, but they don't have the regulation which would give them entrance upon demand. But they can request it.

Mr. BUTTERWORTH. They can request but they do not request right now.

Mr. FISHER. They have not made a practice of randomly doing that, no. At least not to our knowledge.

Mr. BUTTERWORTH. Thank you.

Mr. BURTON. And they cannot pass the regulation; is that right?

Mr. FISHER. FAA has told us in writing that they think they have the statutory authority to base such a regulation on, yes. They are studying whether they need to do so.

Mr. BURTON. Whether they need to do so?

Mr. FISHER. That is correct. As I understand it, this would be part of their revised regulations they are talking about.

Mr. BURTON. They still are not sure whether they need to do anything about these problems?

Mr. FISHER. They have only told us that they are studying whether they need to.

Mr. BURTON. Getting back to the plane that they told not to take off, couldn't the FAA have the air traffic controllers refuse to clear the pilot for takeoff?

Mr. ESCHWEGE. I hadn't thought of that.

Mr. BURTON. That is a lot easier than going to court and getting an injunction. You just tell one of your employees not to issue a clearance.

Mr. FISHER. As we understand it, air traffic can only delay a takeoff for traffic priority.

Mr. BURTON. They can't do it for safety?

Mr. FISHER. That is our understanding. That is what we have been told. They cannot do that.

They can bluff, and we have been told in some cases they have attempted to do that by not clearing an aircraft for takeoff.

Mr. BURTON. Why couldn't they refuse to clear an unsafe plane for takeoff? Who says they can't do that? The FAA?

Mr. FISHER. It is not permitted in the air traffic rules.

Mr. BURTON. Well, it might be worth taking a chance.

Mr. FISHER. As I said, in some cases we are told they have bluffed and kept the aircraft on the ground.

Mr. BURTON. Who makes those rules? Does FAA make those rules?

Mr. FISHER. That is right.

Mr. BURTON. Thank you very much for your testimony. We may have some questions in writing. We would like to commend you for the very thorough job you have done and for further depressing at least this subcommittee member on the commitment of the FAA to aviation safety.

Mr. ESCHWEGE. Thank you very much.

Mr. BURTON. The next witness will be Langhorne Bond, Administrator, Federal Aviation Administration. He is accompanied by Mr. Ferrarese, Acting Director, Flight Standards Service; Mr. Walk, Director, Northwest Region; Mr. Robinson, Chief, Engineering and Manufacturing Division; Mr. Beard of the Western Region; Mr. Swatek, Director, Southern Region; Mr. Martin Pozesky, Chief, Communications Development Division; Glen Tigner, Acting Director, Air Traffic Service; and Albert Albrecht, Deputy Associate Administrator for Engineering and Development.

Mr. Administrator, we are going to follow the procedure that was followed with the National Transportation Safety Board.

STATEMENT OF LANGHORNE BOND, ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION; ACCOMPANIED BY JOSEPH A. FERRARESE, ACTING DIRECTOR, FLIGHT STANDARDS SERVICE; CHRISTOPHER B. WALK, JR., DIRECTOR, NORTHWEST REGION; JAMES O. ROBINSON, CHIEF, ENGINEERING AND MANUFACTURING DIVISION, FLIGHT STANDARDS SERVICE; CRAIG BEARD, WESTERN REGION; PHILLIP SWATEK, DIRECTOR, SOUTHERN REGION; MARTIN POZESKY, CHIEF, COMMUNICATIONS DEVELOPMENT DIVISION; GLEN TIGNER, ACTING DIRECTOR, AIR TRAFFIC SERVICE; ALBERT ALBRECHT, DEPUTY ASSOCIATE ADMINISTRATOR, ENGINEERING AND DEVELOPMENT; JONATHAN HOWE, DEPUTY GENERAL COUNSEL; AND CLARK ONSTAD, CHIEF COUNSEL

Mr. BOND. Good morning.

Mr. BURTON. Since the hearings were scheduled, the San Diego midair collision occurred and has raised some questions in the minds of the subcommittee that we would like to ask you.

You also have two statements. You have the statement on the certification process, a part of which is directed, I guess, to your continuing relationship with the Air Line Pilots Association, and the rest of which goes through your certification procedures, most of which was put before the subcommittee on Wednesday by the Aerospace Industries Association.

Without objection, they will be made part of the record.

[See pp. 415–444.]

Mr. BURTON. We would like to have you read and highlight your statement on the dry-lease situation, and then I think there will be questions on the certification process. That will allow you to maybe answer and perhaps refer to parts of that statement.

I would like to ask a question on collision avoidance systems at this time.

When we had the November hearings last year, we got into a substantial discussion about see-and-avoid concept versus the need for a collision avoidance system. At that time there seemed to be a lessening urgency in the agency on collision avoidance systems. They felt that see-and-avoid was and, I guess, still is a cornerstone of aviation safety.

As I understand it, you have recently changed the BCAS system concept from one that included both an active and a passive mode, to one that used only an active mode which would be linked to the development of the DABS. As I understand it, this will take about 2 years of further study, testing, and evaluation. This is opposed the last we heard, that we were only 2 years away from actually implementing a collision avoidance system.

Could you make some comment on that?

Mr. BOND. Yes, Mr. Chairman, I would be happy to do that. I am accompanied here by Martin Pozesky and Al Albrecht, who are from our research and development offices, and Glen Tigner from Air Traffic, who will help address this question.

I also appreciate your wanting to go to the questions about the San Diego crash first. I thought, if you would be so kind, I would read a brief statement on that subject as was done previously by the other witnesses.

Mr. BURTON. That will be fine. We did not have a statement from you on that. That will be fine.

Mr. BOND. Thank you very much, Mr. Chairman.

Before I begin my prepared remarks, I would like to address the events of this past week.

We are all aware of the tragic accident that occurred in San Diego on Monday. I am acutely aware of the tremendous loss that has occurred. Relatives and friends of the deceased have my deepest sympathy and prayers. I am also acutely aware of the effect this incident is having on those men and women, both in Government and in private industry, who have dedicated their lives to making the U.S. air transportation system the safest in the world.

These people are also in my thoughts and in my prayers. I would like to assure all of these people as well as the entire American traveling public, that the FAA is thoroughly dedicated to finding the cause of this accident and is doing everything in its power to see that similar accidents do not occur in the future.

I began my speech Tuesday announcing our new commuter safety standards with these sentiments.

I have listened with great interest to the commentary that has followed this accident. It is only natural that people want to find an answer to the crash as quickly as possible. This in turn leads to speculation. A certain vocal segment of the community has engaged in a

running commentary on the FAA. I am reminded of a statement made by Winston Churchill before the House of Commons on January 22, 1941, wherein he said, "I do not resent the criticism even when for the sake of emphasis it parts for the time with reality."

I say to you before this subcommittee of the House of Representatives that, given this tragic accident, criticism, which for the sake of emphasis parts with reality, does a great disservice to the American public.

The reality is that there has been an accident and it is entirely too soon to make any judgment as to the cause of the accident or as to what corrective actions may be necessary. The best accident investigation team in the world consisting of National Transportation Safety Board and FAA personnel, Air Line Pilots Association personnel, and others were on the scene and the cause will be found through proven scientific, investigative techniques.

Reality is also that America has the safest and the most sophisticated air transportation system in the world. The reality is that the traveler in America is 20 times safer traveling by air than by automobile.

The reality is that the National Transportation Safety Board has determined that the total accident rate per 100,000 aircraft-hours flown by U.S.-certified route and supplemental air carriers has declined by almost 70 percent over the last decade.

It is a fundamental axiom, Mr. Chairman, that it is much easier to be critical than to be correct. The FAA's principal critic in the case of this recent tragic incident is Capt. J. J. O'Donnell of the Air Line Pilots Association.

Mr. BURTON. He is not, sir.

Mr. BOND. It is interesting to reflect that in the case of the TWA 514 crash at Dulles on December 1, 1974, Captain O'Donnell was likewise quick to criticize. At the time of the accident, Captain O'Donnell pointed the finger at the controller. When the Safety Board issued a preliminary report——

Mr. BURTON. Excuse me, Mr. Administrator. With all due respect, I do not want to get into a fight between you and Captain O'Donnell. The reason that I said he is maybe not the most vocal critic of the FAA is that a very dear friend of mine died in that accident. So, I don't want to get into the problems you have had with Captain O'Donnell and what he has said in the past. If you want to address yourself to the San Diego accident and collision avoidance systems, that is fine. If you and Captain O'Donnell want to have a debate somewhere, that's good, too.

Mr. BOND. Mr. Chairman, I share your sense of loss. Several employees of the U.S. Department of Transportation also perished in that crash. We all feel a deep sense of loss as I know you and others do as well. But I did want to remind you that Captain O'Donnell was permitted the opportunity to criticize the FAA and it seems only fair that this committee should return that same compliment to the executive branch of the Government.

I did want to point out, in closing, that Captain O'Donnell, in regard to the TWA crash, also called for the resignation at that time of the Chairman of the National Transportation Safety Board, who is Governor Reed of Maine.

Mr. WALKER. Mr. Bond, if you will excuse me for a moment. Mr. Chairman, I do not want to be put in the position, necessarily, of defending the administration in this regard, but I would have to agree with Mr. Bond that I think we need to get the entire FAA story on the record of this committee. I would certainly hope that we will listen intently to anything which the Administrator wishes to put on the record this morning.

Mr. BURTON. We will. I don't know about the fight regarding the 1974 514 crash and Captain O'Donnell, but believe me, he is not the one who is the most vocal FAA critic, but go ahead and complete what Captain O'Donnell had to say about the 1974 Dulles crash.

Mr. BOND. Thank you, Mr. Chairman.

I have essentially completed my point on that item. I would, however, point out that ultimately, in a court trial to determine the culpability of our air traffic controller in that incident, our controller was absolved of all responsibility. This is contrary to statements made by Captain O'Donnell.

My point is simply that the causes of aircraft accidents are often complex and are frequently not understood until a thorough investigation, which usually takes several weeks or several months to complete.

As FAA Administrator, my every day is spent in improving the U.S. air transportation system. By their very nature, the problems of aviation safety are complex; ready or easy solutions have a surface appeal, but upon further analysis are found to be fraught with problems and danger.

Collision avoidance is a case in point.

The FAA has been perfecting a total approach to collision avoidance for a number of years. To this end, the FAA, with the support of the Congress, has put in place long-range and terminal radars, and has provided these radars with the capability of giving the controller the aircraft's identity, speed, and altitude. The FAA has installed backup emergency communication systems at long-range radar sites. We have enacted rules requiring the carriage of altitude recording transponders in busy airspace. Terminal control areas have been established in major airport areas. Conflict alert systems have been implemented in the en route airspace and are installed in most of the 63 large terminal areas. The FAA has provided minimum safe altitude warning systems in each of the ARTS III-equipped terminal systems and the development of the software is completed to provide this system in the en route areas. There is no other air traffic control system in the world that matches these achievements.

The area which continues to be technologically difficult is that of collision avoidance devices. Some parties have urged us to adopt a system, which when it detects a potential midair collision, will tell the pilot to dive or climb or to take some similar immediate action.

The FAA has investigated this concept thoroughly and has found that, in the complex air traffic control environment around busy airports, these systems give off a high rate of inaccurate warnings. We feel that inaccurate warnings in this environment would be a tremendous safety hazard. In fact, it would be more of a safety hazard than not having the system on board.

There is an additional problem, Mr. Chairman. The FAA files contain numerous incidents of crews ignoring safety devices that are

shown to be inaccurate. The problem is illustrated by a letter to the FAA from Mr. Ted G. Linnert, director of the Engineering and Air Safety Department of the Air Line Pilots Association, on May 5, 1975. Commenting on a proposed "installation of approved glide-slope deviation monitoring systems," Mr. Linnert states, "The cockpit of the modern jet transport has reached a point where the pilot's ability to properly sort out and distinguish among the various warning sounds and lights has become sorely tested."

The FAA is actively engaged in the development of a system popularly known as the beacon collision avoidance system or BCAS. If it is not already apparent to the members of this subcommittee, it soon will be apparent that the subject of collision avoidance is the most complex in the air transportation industry. This accounts for the intense research that has been conducted by the FAA and for the deliberate pace toward implementation of the airborne parts of this system.

Mr. Chairman, none of these facts minimize the impact of the recent tragedy. But they do, I hope, underscore that the system, while not perfect, is a good one and it is getting better. Nothing we can do will bring those people back to life, but by working together, the aviation community, once the facts are at hand, may be able to prevent similar accidents in the future.

I do not believe, Mr. Chairman, that now is the time for finger pointing or for passing the buck. Now is the time to learn all we can so that if we find deficiencies in the system, we can correct them so that human life can be preserved in the future.

Thank you, Mr. Chairman, for permitting me to make these opening remarks. We, of course, will answer any questions.

Mr. BURTON. Thank you very much, Mr. Administrator.

FAA changed its collision avoidance system concept, that included both active and passive modes, to a single, active-only mode to be linked with DABS. Getting back to that, are there not some problems with this approach?

Mr. BOND. Let me begin, Mr. Chairman, by saying that the subject is extremely complex and that it is complicated by the difficult terminology, language, and symbolism which are associated with these different alternatives. It has taken me a long time and hard work to understand them, and I know it has you and your committee staff as well.

I am going to ask Mr. Al Albrecht, who is our Deputy Associate Administrator for Engineering and Development, to address your question. I hope that the jargon of our business can be understood.

Mr. BURTON. Well, if the poor Members of Congress don't understand, we have some of the most competent staff in the House of Representatives on the majority and the minority, and they might be able to help us out.

Mr. ALBRECHT. Mr. Chairman, we are going to try very hard to explain exactly what we are doing and why we are doing it.

Our current program for separation assurance addresses both ground and airborne equipment. We are pursuing both solutions in parallel.

In terms of ground equipment, the program is directed toward the development of an automatic traffic advisory and resolution sys-

tem using ground computers that have available all the information on terrain problems, on traffic problems and procedures. It can look for conflicts. It can look for potential dangers and accidents. It can automatically transmit this information through a data link. The data link is associated with our DABS system—the discrete address beacon system.

I am going to ask Mr. Pozesky to go through these programs in detail, but what I would like to do is outline what our current program is in its totality.

We are addressing a beacon collision avoidance system which is an airborne piece of equipment—a full capability system that should go almost all the way to solve the collision avoidance situation based on future traffic loads. This is a complicated device, and we are attempting to provide a partial capability—a simpler system—that can provide a substantial degree of protection at a much earlier date.

In addition, we are taking a look at cockpit displays and what elements of information can be sent to the cockpit that can be used by the pilot and that will help him and perhaps distribute the workload in a different manner between the controller and the pilot.

Mr. Pozesky, would you please discuss the programs?

Mr. POZESKY. Thank you, Mr. Chairman.

We have a three-element approach to our collision avoidance system. The first element and the one which will be available the earliest, is a beacon-based collision avoidance system which is of the active type, which you have described. It will provide very good service, but it will have some problems from our analysis in some of the dense terminal areas. I can go into that in more detail.

Mr. BURTON. For brevity, and correct me if I am wrong, the problem the active-only system will have in dense areas is that it will be getting too many signals, and the pilot would be more apt to turn it off and get confused.

Mr. POZESKY. That is one of the problems. The problems which have been characteristic of many of the past collision avoidance devices which have been proposed is that they do have a high alarm rate in our terminal areas where the traffic is dense and there will be whistles and buzzers going off frequently in the cockpit.

That leads us to the second element of our program. That is a full collision avoidance system which contains the best technologies that we now know how to provide. Our program has not changed in that regard. We are trying very hard and very aggressively to approach a full system which has both of what is known colloquially as an active capability and a passive capability.

Mr. BURTON. You haven't changed from that concept?

Mr. POZESKY. We have not changed from that concept in the beacon collision avoidance area.

Mr. BUTTERWORTH. Has there been any recent change in system concepts?

Mr. POZESKY. Within the last 12 to 15 months——

Mr. BUTTERWORTH. No; I mean within the last couple of months.

Mr. ALBRECHT. We are continuously refining our concept.

Mr. BUTTERWORTH. We understood that previously you had a passive-active multimode BCAS which you were basically 2 years away

from implementing. Now, that passive mode had been dropped and you have linked the active mode to DABS. Is that a simplified——

Mr. ALBRECHT. Let's see if we can sort this out.

We have been developing, at least for the past few years, both passive and active modes of collision avoidance systems. Neither alone does the job. The current system which used to be called trimodal—we now call full capability BCAS—incorporates the best features of both of those techniques and, in addition, is smart enough to decide which technique to use, depending on the environment.

That is a complicated development. The technology is now getting to the point where you can put that kind of data processing power in the cockpit. So, we believe that is a viable concept that can be brought along and can be developed. However, it is going to take a few years. We don't want to wait that long to make available for use a collision avoidance device that will provide a fairly substantial degree of protection. It certainly would be protection against every aircraft that is beacon equipped.

So, in addition to the full capability BCAS, we are attempting to produce a standard at the very earliest date, within the next few months, for an active-only system which can be made available and will provide substantial protection.

Mr. BURTON. The pilot has to turn off the active-only system in a high-density airport whereas with the passive mode he doesn't have a problem. Is that correct? I see people nodding their heads.

Mr. BOND. That is correct. The machine will, in fact, turn itself off in a high density area when the system becomes saturated. An active BCAS will not work in a high density area.

Mr. BURTON. Wouldn't that be where it is need the most? Isn't that the advantage of having a passive mode?

Mr. BOND. The answer to that is complicated. Many midair collisions with general aviation aircraft have occurred in the less dense airspace. So, this will provide some protection in less dense airspace and in the en route environment.

Mr. ALBRECHT. If you go back to the last 15 aircraft accidents, about 9 of these could have avoided with an active-only BCAS if it had been available.

Mr. BURTON. Getting to this one, we just don't know for sure what happened, but assuming no misfeasance, malfeasance and nonfeasance on the part of the PSA crew would there not have been, with a passive-mode system, a definite knowledge of the proximity of the Cessna? In other words, you are saying that the accident probably could have been avoided with an active-only system if they had been flying over Kansas. Or at least there was a possibility of knowledge and therefore a possibility of avoidance in San Diego?

Mr. ALBRECHT. I cannot honestly say. The possibility is always there.

Mr. BURTON. You said it was possible that the active-only system could avert an accident in less dense airspace. I think the NTSB people answered that problem, although it was qualified, in the affirmative.

Mr. BOND. Mr. Chairman, if I could respond, I want to emphasize again that passive BCAS is a technology that does not yet exist. It is just coming into existence. We have uncoupled active and passive sys-

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tems in order to make possible early implementation of the active system.

I would like to touch on one other point. I want to remind you and the members of this committee again that a practicable safe system of airborne collision avoidance is not available for purchase or installation today. I want to repeat that. There is not available today any system which we, in the FAA, believe is practicable for collision avoidance.

I do want to point out that one system which has been considered, and on which there is unanimous opinion, I believe overwhelming opinion—certainly in our shop—that is of no value. That is a simple ACAS, or airborne collision avoidance system, which goes from one aircraft to the other and which will have a high incidence of false alarms, and which will cause aircraft, if they follow the dictates of the avoidance system, to make sudden changes in course and altitude. We are convinced that that will cause additional problems in dense airspace. We believe this system is unsafe, and we are not going to install it. We have almost unanimous support in that position from the pilot and user communities.

Thank you.

Mr. BURTON. There was a study done by DOT's research and special programs where they said that the BCAS in a passive mode is a technically feasible concept.

Mr. BOND. My comment a moment ago was on the ACAS system. I was trying to point out that there is none available for installation and purchase now.

Mr. Pozesky, would you like to comment?

Mr. BURTON. Could you comment on a statement that I believe was made by NTSB and Mr. Walker, to the best of my recollection, confirms it also. You seem to be committed to a cockpit to ground system, as opposed to cockpit to cockpit system, because you will have control perpetuate whatever type of equipment is on the ground, like DABS.

Mr. BOND. That point is a good one. Our current opinion is that the most promising system is indeed a DABS–ATARS-based collision avoidance system. All the DABS systems that we are talking about today are essentially transponder-based systems. Transponders are now in aircraft, of course, and DABS is really a supertransponder, a Mark II type of transponder with several more modes installed on it. I do not know why we have chosen to use a word other than transponder. Nevertheless, it is transponder based.

The difficulty with the BCAS system and the ACAS system which I described to you a moment ago, is that they can only sense potential aircraft conflicts but they cannot know other very, very important facts and figures that are needed for aircraft safety. One such fact is whether an airplane in the airspace is on a correct, nonconflicting course; in other words, 1,000 feet away but proceeding at safe separation and parallel. It cannot know that.

Secondly, it cannot sense terrain features. By using the system which we now think has the greatest potential—the DABS–ATARS system—and running the information through our ground-based computers, we are able to filter the information that goes back to the airplane, taking out false alarms about aircraft that are on the correct track and that do

not present a potential conflict. These false alarms will never go to the pilot. We can also take into consideration the terrain. The DABS–ATARS system, which we think is the best, will be able to discount false alarms and will be able to sense terrain conflict. It will present to the pilot a conflict alarm that is a genuine one. It will be correct.

We have very substantial support from the aviation user community in saying that this is, in the long run, the best approach to our collision avoidance system.

We have had industry meetings and meetings with pilots; almost every group that we know of is on record with the FAA in favor of the DABS–ATARS system as the best system. We have not made up our minds because technology does evolve. However, it now seems to us to be the best.

Mr. BURTON. I yield for a couple of questions to Mr. Butterworth and other members of the committee.

Mr. BUTTERWORTH. I don't think we know much about this, but let me state something so that we don't end up arguing about it. I do not think we are arguing about the feasibility of a true ACAS system. I do not think we are arguing about the long-term potentials of the DABS addition to your present ground-based radar system. All I am trying to get at is that there has been a recent change in the BCAS concept, in which you have dropped a multimode BCAS for an active-only BCAS and linked that to DABS. Is that a correct statement? I was reading an article from Aviation Week on it. There has to be some substance to it.

Mr. ALBRECHT. Let me repeat that a couple of years ago there was apparent competition between active and passive concepts. We have flown breadboard versions of both systems. They are technically feasible, separately. It appeared that neither alone would do the job correctly. So the trimodal BCAS, a combination of those concepts into one fully capable system was a decision that was made about 2 years ago. That basic decision has not changed.

What we did do more than 2 months ago was take a look at the length of time required for that system to be available in the fleet. We said, "It is too long. We cannot wait that long." Then we decided to push an active-only BCAS system to provide an earlier capability that would give substantial protection even though in the high-density terminal areas it would have to turn itself off.

Mr. BUTTERWORTH. This is the decision I was alluding to. That was taken 2 months ago?

Mr. ALBRECHT. A little more than that, I think.

Mr. BUTTERWORTH. Are there not problems with DABS, not necessarily insoluble ones, that have to be worked out?

Mr. POZESKY. We do not believe there are any substantial or significant problems at all. We have been in the business of the development of that system for about 5 years. We have earlier, about 3 years ago, run a very extensive series of live tests with that system in the Boston area. We have awarded a contract to Texas Instruments to build the ground hardware. We have now obtained that equipment. The first of those systems is now installed at NAFEC. We are well into the testing of the system to verify that all of the design features and concepts that we had for the DABS system have, in fact, been achieved.

Mr. BUTTERWORTH. I realize now the question I wanted to ask.

Let us assume that we are now 3 months ago and you haven't made your switch yet. What is the earliest date by which you would have a trimodel BCAS equipped in airliner cockpits? What was the implementation plan? When was the national standard going to be promulgated? Now, compare that date to what the plan is now after you have made your recent switch. That is all I am asking for—the dates.

Mr. POZESKY. The switch you are referring to has to be addressed in a broader context. We have done a great deal of work on the full BCAS. We have, jointly with DOD, done some conceptual work. We have contracted with industry people to put together some hardware for flight tests and experiments. That has been done.

To validate the basic feasibility of the concept is a long way from having a piece of equipment off the shelf. But the basic feasibility of that passive concept which, until about 2 years ago, was very, very controversial in some quarters as it is today, we believe has been achieved. We did an analysis and called in experts from many places in the country—people from MIT participated, et cetera—to look at that work and to consider those results in the context of a total system which would address all of the problems. We have melded that together into the best complex of systems which will work in all environments.

Mr. BURTON. Just so the other members of the committee can ask questions, the question was that at one time there was a 2-year date for implementation of the active-passive system. You have now decided that you can achieve the technology, I guess, quicker, although it isn't better, but at least you could make a giant step by going active-only. What is the time frame for the implementation of that? I hear that it will be 2 years, not to implementation, but 2 years to the study and testing.

Mr. POZESKY. Of the active-only system?

Mr. BURTON. Yes.

Mr. ALBRECHT. Iet me give specific dates, Mr. Chairman, the best we can. We still have some developmental work to do on the full capability BCAS. We are estimating that it could not be available for use in the fleet before 1983–84.

Mr. BURTON. Is that active-only?

Mr. ALBRECHT. No. That is full capability.

Mr. BURTON. That is full capability.

Mr. ALBRECHT. For the active-only system, we plan to issue a standard which could be used as a basis for industry producing equipment before the end of this year. Normally, it would take them some time to produce units, so, perhaps a year after that equipment could be available for the fleet.

Mr. BURTON. But you are not going to lose track of the passive mode, are you? You are not going to say "We've done this" and put it on the back burner again, are you?

Mr. ALBRECHT. The passive system is in our complete capability BCAS. It will stay there.

Mr. BURTON. I know. But are you going to act on it or is it just going to be put back——

Mr. ALBRECHT. It is a necessary capability to provide the kind of protection that the full BCAS will provide.

Mr. BURTON. Do you intend to pursue that full BCAS even as you are going with the active?

Mr. ALBRECHT. Exactly.

Mr. BOND. Mr. Chairman, let me add one more point.

The active BCAS system is a technology which is essentially duplicative of what exists today in our system. There is a transponder in most aircraft and especially in most aircraft in terminal areas. There is an interrogator on the ground at our 200 radar sites. Those two pieces of equipment exist today. The active BCAS system essentially proposes to install another interrogator in an aircraft and to do to the transponder in the third plane, the other plane, what is now done back and forth from the ground. It is relatively simple and existing technology.

The difficulty with the active system, as you quite correctly pointed out, is that it becomes saturated in high-density terminal space and will not provide protection in that area.

The passive system will provide collision warning in the denser areas; what it does is listen in on the communications between transponders and other aircraft, and our ground-based interrogators. That is new. That does not yet exist. We are in the development phase of that. It will take time for that even to come into being in some sort of a producible way. That is why this time gap in the development of technology and why we have chosen to split these two in sequence. Earlier protection can be provided by an active BCAS.

Mr. ALBRECHT. To us there is an extremely important reason for maintaining the passive system in a full capability. Namely, you can get directional information through it, and you cannot get directional information through a purely active system. That means an active system can give up and down kinds of indications as to what the pilot should do where the full capability BCAS has the option of providing right and left instructions also which is much more compatible with the way the ATC system operates.

Mr. BURTON. I yield to Mr. Walker and then Mr. Hightower.

Mr. Walker?

Mr. WALKER. Thank you, Mr. Chairman.

Mr. Bond, I would like to go through a moment the statement you gave here earlier, and a few of the points you made to try to get some clarification based upon some of the things this committee has heard previously.

In the last couple of days we have heard, as I am sure you are aware, some very critical testimony with regard to FAA. You have made mention in your statement earlier that there are certain segments of the community that are extremely critical of the FAA. You felt that this was what we were hearing.

It seems to me, however, beyond that, we have had a GAO report here this morning that was very critical, which goes far beyond the critics that you may have out there in society somewhere. We have heard charges that go so far as to imply complicity. In fact, it was stated that complicity on the part of FAA was responsible for the recent air disaster, and some that went before it.

Those are extremely serious charges, and I think they are charges which the public is very concerned about, and this subcommittee is very concerned about. Having said that, I want to make the point that I am not really very well versed in all of the technical jargon that goes back and forth here, but I am concerned from the standpoint of

being somebody who flies on airplanes, and has an awful lot of constitutents who fly on airplanes. I think their general impression of what FAA does is guarantee them an essentially safe flight. I think that when they get aboard an airplane they are under the impression that the airplane is safe, that the airways are safe, and that the Government is giving them some kind of guarantee of safe passage.

You have made the statement that we have the safest system in the world. I hope that is true. But we have critical evidence before this subcommittee at this point that the safety of that system has been called into serious question by the airline pilots, by the GAO, and so on. So, what I want to nail down is just a couple of points here that I think will help us be more constructive than critical.

When you talk about a total approach to collision avoidance, do I understand that this is something that you are building towards and phasing in rather than waiting for all of the technology to become available before you install it? Do I understand that the present philosophy at FAA is to take those things which are workable and phase them in as rapidly as possible in order to have as much of the technology as is feasibly possible put on the airplanes at the earliest time? Is that my understanding of what you are trying to do?

Mr. BOND. I am sure that is your understanding, and that is also the case.

Permit me to enlarge on that a little bit. What we are doing is essentially as much as we can do immediately. That statement is correct and it would have also been correct 5 or 10 years ago. It is correct, for example, to suggest that our emphasis on separation assurance, that is to say, collision avoidance, has primarily been based to date on a ground-based controlled system which uses airborne transponders, radar transmitters and interrogators, and a radar screen, and, of course, a radio linked to the pilot to tell him to turn left and right and so forth.

Building on that system, the collision avoidance systems that I have described to you today are now possible. It is especially distressing to me to hear people accuse the FAA of trying to build a ground-based bureaucracy when, in fact, the proposals which we have now would not have been possible without the FAA's ground-based computer systems. The systems for DABS and ATAR's would not exist without the transponder-radar-computer system on the ground. We are building upon what we have done to provide a pilot warning system which will be superior to anything we have been able to conceive in the past. It would not have been possible if we had not made those investments in ground equipment first.

It is evolutionary. The whole aviation business is evolutionary.

Mr. WALKER. Given that context and given an idea of where you are going, I am having a little bit of difficulty, and I think some of the people that we all serve in the public are having difficulty, understanding where we are. It seems to me the greatest criticism we have heard of the technology that is presently available, and that could be on the airplanes right now, is that it generates some false alarms.

Now, from my perspective, some alarm is better than no alarm. If a crash is going to occur, and there is some warning of it, even though it may take some sorting out, If I am a passenger aboard that airplane, I think some warning is better than no warning at all.

Why isn't that the case, and why isn't that a part of the philosophy of phasing it in at the present time?

Mr. BOND. First of all, there is none available except for the ACAS system. The BCAS system is not available yet.

Mr. WALKER. Why isn't the BCA system available?

Mr. BOND. The technology is still developing. We have it in process. As Mr. Albrecht says, the active BCAS spec will be out soon. We have separated it from the passive BCAS for the sake of expediency in installation. Otherwise, both would have to wait.

Mr. WALKER. Let me pursue this a little. What are the problems that make the BCAS unavailable at the present time? Why isn't that technology available?

Mr. BOND. The technology is under development, and has been for some time.

Mr. WALKER. Specifically, what are the technological hangups at the present time with that system? I think that gets to the heart of what we have heard as the chief criticism, the complicity of the FAA in collisions.

Mr. BURTON. Could you yield for a minute?

Mr. WALKER. Yes.

Mr. BURTON. Again, citing the DOT study, it is concluded that the BCAS system is technically feasible, and that the passive mode with a reference signal would be more accurate and less troublesome than other BCAS alternatives. This is in a report done by your parent organization. I guess for you the period covered was from about 1975 to 1978—3 years. That is just a little bit of background for you in case you did not know this study existed. It says it is feasible, so now you can answer Mr. Walker on why it takes so much time.

Mr. BOND. I was reading the testimony of some of the other witnesses that appeared before this subcommittee and I think there has been some clever use of words.

Mr. BURTON. This is yours. It isn't anyone else's. This is the Department of Transportation speaking.

Mr. BOND. I understand that. There is a difference between feasibility and availability. Feasibility means we think it can be done. There is no disagreement between that report and what we believe today. There is the question of whether or not it is ready, what has developed, and what specifications have been presented, and whether it can be installed in aircraft. That information does not yet exist on BCAS.

Mr. WALKER. The criticism is that it is your job. If it is feasible, it is your job to take what is feasible and make it available.

Mr. BOND. That is what we are doing.

Mr. ALBRECHT. Let me be a little more specific, Mr. Walker.

As far as the full capability of a BCAS is concerned, one has never been flown. We have not put together a piece of equipment that combines active and passive technology with a logic that will make them both work together.

Mr. WALKER. How then have you determined the feasibility?

Mr. ALBRECHT. We have known the two techniques, separately, will work. We haven't put them together, and we haven't come up with a package that we can get inside an airplane yet.

Mr. WALKER. How long have you known that such an approach is feasible?

Mr. ALBRECHT. I think we had confidence about a year ago it would be feasible, but it requires work. We are doing it as fast as we can.

Mr. WALKER. You are saying that it has been about a period of 12 months. You have been convinced of the feasibility of a BCAS kind of system for that long.

Mr. ALBRECHT. And we have been working hard to get it implemented.

Mr. WALKER. OK. My question was: When did you become convinced of the feasibility? A year ago? Not before?

Mr. ALBRECHT. I think we became convinced about a year ago that concept would meet the requirements. We were concerned with operation in the high-density areas.

Mr. WALKER. That goes back to the false alarm business. My point is this. A lot of us would like to think that maybe some alarm is better than no alarm. Maybe that should have been considered as a part of the picture, too. I am coming back to where I was originally. Is that the primary technological hangup—the false alarm problem?

Mr. ALBRECHT. No. It is a matter of collecting the data processing technology to put together with microcomputers in a small enough package the very large amount of processing that has to take place before the passive and the active system can work together. It just has not been done. There is a lot of programing work. There should be no state-of-the-art problem at this time, but it hasn't been done yet.

Mr. WALKER. Now, wait a minute. I am trying to gather this in. Are you telling me that the problem is not so much the false alarm problem but the size of the package that goes into the airplane?

Mr. ALBRECHT. I am telling you there are both problems.

Mr. WALKER. OK. So both problems are there.

I am having trouble with this. Why is the size of the package a problem? These airplanes are pretty big. Are we talking about a computer the size of this room that is needed to put aboard the plane?

Mr. ALBRECHT. No, but the equipment that has been flown so far was breadboard equipment. It is very large. It takes up a number of racks, if you will. It is about 4 or 5 feet high. You need to be able to put together a package that the aircraft can accommodate. We don't have any concern that this can be done, but it has not been done yet.

Mr. WALKER. How big an object are we talking about? If we are talking about something that would work to avoid accidents, I would think that we should be able to find plenty of room in the airplane to do it.

Mr. ALBRECHT. Mr. Walker, we are talking about an engineering problem. We don't have any concern that it has a solution, but we still haven't produced a device we can point to and be able to tell the industry to go ahead and build it. We need to do that as fast as we can.

Mr. WALKER. I get back to the point that if there is technology available today that can be phased in it should be. I'll admit that maybe it isn't the ultimate technology and maybe we haven't reduced the computer from room size, or from table size, or whatever, to the size of my wristwatch, but nevertheless, if there is technology available that is workable technology, why aren't we phasing that in immediately if we know that it could have some potential for avoiding accidents?

Mr. ALBRECHT. Using your approach, which we agree to, that some warning is better than none, we made the decision to release the specification or standard for the active-only system which would provide some warning as soon as possible.

Mr. BURTON. What was this based on? What was the study that said the passive mode was feasible? Didn't they have equipment that they tested, or did somebody sit down in a room somewhere and think it up?

Mr. POZESKY. The study was based on the kind of experiments that Mr. Albrecht talked about. It was large equipment in a limited environment, and it was also based upon a good deal of analysis and testing.

Mr. WALKER. What you are saying is that they actually flew that equipment and it worked.

Mr. POZESKY. They flew an experimental model of that equipment. It was not a package model. It did not have all the necessary features in that hardware to deal effectively with all the problems.

Mr. WALKER. But they flew some equipment and the equipment worked. They came to the conclusion that it was feasible. Is that right?

Mr. POZESKY. That is correct.

Mr. WALKER. When did they do that?

Mr. POZESKY. They are still in the process. You have the date of the report. I will guess that it was 4 or 5 months ago.

Mr. BURTON. Over a period of 3 years.

Mr. WALKER. Over a period of 3 years, Mr. Chairman?

Mr. BURTON. The study was a 3-year study.

Mr. WALKER. Someone must have decided there was some feasibility to this 3 years ago—not a year ago.

Mr. POZESKY. There was promise of this. We went through a test program and got sufficient laboratory type equipment to validate its feasibility. We are elated that that feasibility, as indicated in that report, has proven true. The next step in that process, and where we are engaged right now, is to move as rapidly as we can toward getting that system built by industry and the people who would ultimately package it for airliner application and make that system available as soon as possible. That is precisely where we are on that system.

Mr. WALKER. I will be glad to yield.

Mr. HIGHTOWER. I think Orville and Wilbur proved that flight was feasible, but it took a while to break the sound barrier. Now, I think we are just wasting a lot of time talking about something being feasible and then why isn't it immediately available. I think we ought to be able to understand that. There are engineering problems. There may be economic feasibility questions still to be resolved. We are talking about trying to get a system that we can put in all of the planes. That means that it has to be of minimum size. It has to be tested adequately. I would certainly join the chairman and Mr. Walker in urging that they move just as quickly as they possibly can, but I do not think they ought to take any giant steps that will leap over any difficulties that would make us believe that we are going to have a solution before we ought to have it.

Mr. WALKER. I thank the gentleman for those comments. What I was getting back to was the statement originally made which is, "We

are phasing in the best possible technology that we have in a program that is going to eventually result in a total approach to collision avoidance."

What I was trying to sort out here is this: What are the problems with what we now know? If I gather correctly what I found out, it is: (1) There is a problem of false alarms; and (2) there is a problem of size. That is where I think we are right now. Are there some other problems as well?

Mr. ALBRECHT. There are a number of other problems, Mr. Walker. There are things that need to be done in a completed system that we haven't really tied down yet.

One is the threat logic. How do you handle multiple threats? How do you really automatically switch between these various modes and make sure you are in the right one? There are things where it is clear you can do it, but we have not done it yet.

Mr. WALKER. OK. Let me follow on in that. If I understood the testimony of the airline pilots when they were here, presently the system of collision avoidance involves a lot of see-and-be-seen looking out the window. If what we are talking about here is getting an alarm, and maybe it is a false alarm and maybe there is a problem with all these different modes that I don't understand, but at least there is something in the cockpit and the pilot still has the option of looking out the window just like he is right now.

Wouldn't it be better that he looks out the window or try to find something that he thinks might be a problem than to never know about the problem and never to know to look out the window?

Mr. ALBRECHT. You are never going to replace the pilot's eyeballs. That is the best possible system going. On the other hand, there are a lot of other elements in the system to provide protection.

Mr. Bond indicated conflict alert had been installed in the en route centers and in most of the high-density terminal areas. Conflict alert automatically tells the controller there is a predicted problem and to go and do something about it. The system is working very, very well and has made a number——

Mr. BURTON. It did not work in San Diego because one plane was talking to the Miramar controller and the other was talking to the Lindbergh tower controller.

Mr. ALBRECHT. It is not perfect, but it has been very effective.

Mr. WALKER. Mr. Bond?

Mr. BOND. I was going to offer some comments on the question of see-and-avoid. The ultimate responsibility of the pilot is looking out of the aircraft and keeping an eye out for other airplanes in the area. While that system is obviously not perfect, it is probably the best system that anyone has yet developed.

I said at my testimony some time ago before this committee that, whatever we did in the way of adding mechanical systems to help pilots and to give them conflict predictions, we cannot conceive, nor can our friends in the Air Line Pilots Association, of any time where we would remove from the pilot the responsibility to keep looking outside of the airplane. It will always be the last——

Mr. BURTON. I don't think even if you made a regulation on that they would follow it. As long as they are flying they will look out the

window. With all due respect, I don't think anyone is saying that we should put blinkers on them.

Mr. BOND. I did not follow that, Mr. Chairman.

Mr. BURTON. I don't think anybody is talking about removing the pilot's eyeballs—nobody in this committee, anyway.

Mr. BOND. The point has been made that there is something backward or flawed in requiring pilots to utilize ultimately a see-and-avoid concept.

Whatever we do, there will always be at the end of the chain the responsibility of the pilot to look out of the aircraft and visually sense the presence of other aircraft.

Mr. WALKER. I think we are absolutely in agreement with that. I think you are helping make my point, if I might say so. My point is that if you put the equipment on board that gives the pilot the warning, even though in all instances it might not be the best possible one, at least he might have some warning in order to see-and-avoid.

I do not see why we are not moving ahead with that technology if, in fact, what we are trying to do is phase in that which we know as quickly as we can.

Mr. BOND. I don't think you are giving sufficient significance to the false warning problem. It is one that really does trouble us and also the pilots.

There can be many, many conceivable cases, for example, where an aircraft—it is hard for the pilot's vision to see behind or above. If the pilot is to respond to the collision avoidance warning, he really ought to do so immediately. He will have to take a sharp and immediate left turn, or right turn, or a climb, or dive the aircraft. That will put the pilot in the middle of other aircraft tracks, very conceivably in dense air space.

Mr. WALKER. And very quickly.

Mr. BOND. Immediately. The pilot will have to respond immediately if he is to really use the system as it should be used. We are very concerned about the additional safety hazards that may be caused by that action. As anyone who has visited an air traffic control center or approach control center can see, we space our aircraft out carefully one after another in trail, with a 3- or 4-mile separation, and 1,000 feet vertically, in a net well-arrayed chain.

The prospect of aircraft violating that chain and flying off in some other direction suddenly is one that our air traffic control people are worried about.

Mr. HIGHTOWER. Mr. Chairman, if I may, I would like to ask some questions.

Mr. WALKER. I am finished, Mr. Chairman.

Thank you.

Mr. BURTON. Mr. Hightower?

Mr. HIGHTOWER. Mr. Chairman, I think this has been very interesting talking about various systems, and what needs to be done and what is being done to perfect some kind of a system. But as I understand your testimony, Mr. Bond, we have no black box. We don't have one now. We won't have one for several years. Yet, we have a tremendous amount of air traffic.

I would like to talk a little bit about methods rather than systems. I would like to talk about methods of collision avoidance.

Mr. Chairman, I understand—I have been told that there is a guard frequency that is available for emergencies to both military and civilian pilots. The military frequency is not the same as the civilian frequency, but both frequencies are designated for emergency use. Military radios, as I understand it, are equipped to receive two frequencies at the same time. One of these frequencies is set manually by the pilot for routine communication with the control tower, flight control center, or perhaps another aircraft. The receiver is also preset to monitor the guard frequency at all times. In an emergency situation, that is with military craft, the pilot will be informed immediately no matter where he sets his radio manually. In other words, he is capable of always monitoring the guard frequency.

Civilian radios, as I understand it, on even the most sophisticated aircraft, monitor only one frequency at a time while a guard frequency does exist which has been set aside for civilian use and no one monitors it.

If the planes involved in the San Diego crash had been equipped with radios set to automatically monitor the civilian guard frequency, the chances of warning each aircraft in the proximity of the other would have been easier. Even if the radios on each plane were set to separate frequencies they both would have heard the same emergency guard transmissions.

Tuesday, we had testimony that it was quite possible that both the private plane and the airliner could have been switching. One was under some VFR monitoring and control and the other was controlled by radar from a distant point. It could be that there was a hole that was hard to predict but was always possible of existing where the word could not or did not get through, and the pilots did not get the accurate information.

My question is, Mr. Bond, that if we do have this capability of a system or method of avoidance, not particularly a system—you can call it whatever you like—we do have a method that is universally used by military, and I wonder why this is not used by civilians, and if the FAA has examined this and made some determination that it was not necessary or infeasible?

Mr. BOND. Let me ask Glen Tigner of our Traffic Service to answer that question.

Mr. TIGNER. We looked at that some time ago, Mr. Hightower. Frankly, we have not found in the civilian area a need for that kind of——

Mr. HIGHTOWER. We do have a need, do we not? We had a crash in San Diego. We have a long history of these crashes.

Mr. TIGNER. We have not had a communication problem. I hesitate to speak to San Diego. That is speculative. It is probably unfair, and it is currently under investigation by the National Transportation——

Mr. BURTON. Could you assume for a moment that one plane was in contact with Miramar, which was the testimony we heard, although it wasn't holy writ. The other plane was in contact with the Lindbergh tower. Miramar saw the problem and warned the Cessna on its frequency, but we don't know whether they could break through to the frequency of the PSA pilot.

Mr. TIGNER. I guess part of the problem is that I am not sure that is a valid assumption.

Mr. BURTON. Let us assume it is valid, or that it could happen for Mr. Hightower's question.

Mr. TIGNER. If we are going to deal in the hypothetical and that is a very difficult arena——

Mr. BURTON. I am sorry that I interrupted. Deal with his question as to why you cannot do that.

Mr. HIGHTOWER. You say you examined it and determined that it was not needed? Is that your answer?

Mr. TIGNER. Yes. We found that the reliability of our communication and the civilian communication was good.

Mr. HIGHTOWER. You say that you determined that the method was adequate. But yet we have situations probably all the time where you have one plane monitoring one system and another another. The method would make it possible, I think, that there would be many a close call where one plane is listening into one place, another another, and they have no way of communicating back and forth to contact both. One could be very excited about what they see on radar and the other is on VFR and is not concerned at all. Isn't that apparent?

Mr. TIGNER. That has not been our experience. Our looksee at that some years ago was that the interference coming through on 1215 might interrupt a critical control instruction on the discrete frequency and we have——

Mr. HIGHTOWER. It would be critical before they would interfere.

Mr. TIGNER. I am talking about another traffic control situation where they are trying to separate two other aircraft.

Mr. HIGHTOWER. I am not sure we are talking about the same thing. As I understand this guard system—you correct me if I am wrong since you have looked at it—it is there for just this purpose of being able to break in and say: "Look out, there is a critical situation developing here" and it would not be something that somebody would just constantly chatter on. But, if there is a danger that needs to be immediately communicated with the civilian monitoring the guard frequency, then whoever has the responsibility could pass the word immediately. Yet, that guard frequency is not used.

Mr. TIGNER. It is not used very much, incidentally, by the military. It is strictly an emergency kind of situation, as you point out.

Mr. HIGHTOWER. Let me ask you a question about that. You say it is not used by the military. Are you telling me that the military do not monitor their guard frequency?

Mr. TIGNER. No; I am not telling you that.

Mr. HIGHTOWER. All right. Then it is used if it is monitored. It is just not necessary to come in and sound an emergency often, thank goodness. If it is monitored, it is being used.

Mr. TIGNER. All I can tell you is when we looked at it that disruption was so critical to other control instructions that might be issued on the discrete frequency, that we did not follow that approach. I don't know, frankly, what particular benefit the military at this point in time get out of that device. We handle it more procedurally. When an aircraft is in a certain air space, it is worked a particular——

Mr. HIGHTOWER. Obviously, they are getting some benefit out of it. It is one of those things where good news is not often used. It is just bad news that gets a lot of attention. Nobody writes about the hundreds of thousands of flights where there is no problem, but we get a

lot of attention where one develops. To say that we evidently don't need all of these safety facilities because we don't have any accidents begs the question.

Mr. TIGNER. I don't know how else to respond. We were concerned when we looked at it. That a broadcast by some other facility on 1215 talking to some other aircraft in another area could disrupt a critical control instruction of two aircraft in some other location.

Mr. HIGHTOWER. Let us understand what I think I am talking about. I am talking about an FAA monitor and an FAA control guard frequency with the FAA man in Miramar and the FAA man on the VFR tower. If the man at Miramar sees a problem, he jumps on the guard frequency. If the man in the VFR tower sees a problem, he jumps on the guard frequency. I am not talking about some outside group. I am talking about you people that have the responsibility and using this system works with the military.

Mr. TIGNER. Let us get away from San Diego and go to San Francisco. The tower, for example, is working some aircraft over there at the San Francisco airport and they were issuing some critical instructions, or about to issue critical instructions. The IFR room over at Oakland broadcasts on 1215, which is the emergency frequency you are talking about, that goes out to all aircraft that are in sight of that transmitter and it blocks the primary frequency. So, if San Francisco were trying to avoid a collision at their airport using their discrete frequencies, the fact that Oakland transmitted on 1215 would block that transmission by San Francisco and therefore, in fact, might cause a collision.

That is sort of the rationale we used.

Mr. HIGHTOWER. When was this last examined? When was this examination made?

Mr. TIGNER. I would have to guess on that. It was about 10 years ago.

Mr. HIGHTOWER. About 10 years ago?

Mr. TIGNER. That was about the point and time the military put it into their aircraft.

Mr. HIGHTOWER. Mr. Bond, this having been looked at 10 years ago, do you think it might not be good to look at it again and bring it up to date?

Mr. BOND. Yes, we will be happy to do so.

Mr. HIGHTOWER. I have a couple of other quick questions, Mr. Chairman; I do not want to use too much time.

We heard some testimony a little earlier that funding had been a problem in administration in the southern region. Has that been the problem in FAA in the administration of some of these things?

Mr. BOND. I don't believe that is true. I don't believe that is the case at all.

The people we have here at the table are traffic control folks.

Mr. BURTON. This deals with the "Cockroach Corner" problem.

Mr. BOND. Right. You are talking about the part 91 aspect. I have the folks from the southern region here, and we were expecting to turn to that.

Mr. BURTON. If you will yield, Mr. Hightower. As soon as we can get through this part you can bring in your experts on the "Cockroach Corner" problem.

Mr. HIGHTOWER. That is all the questions I have on this issue, Mr. Chairman.

Mr. BURTON. Mr. Evans?

Mr. EVANS. Thank you, Mr. Chairman.

Mr. Bond, as I understood earlier in your testimony today, you said that the FAA was working on a ground collision avoidance system and also on a beacon collision airborne avoidance system.

Did I understand you correctly that you are going ahead with this ground system and at the same time are continuing in the development of the airborne system with the hope of that being a long-term and, hopefully, a better answer?

Mr. BOND. Yes. That is essentially the prospect.

Mr. EVANS. I would just like to ask a question in regard to why visibility from cockpits is not better than it is currently. I look at the windshields, I guess you could call them, in the aircraft, and they seem to be fairly small. Is there some way of having better visibility from the cockpit area? I suppose you sit close enough to those windows so that you can perhaps see out fairly well, but I just really question the amount of visibility that is afforded in a cockpit.

Mr. BOND. I could ask my folks to talk about the original visibility standards in effect when the aircraft were certificated. Each aircraft goes through a strict study on the subject. I guess we feel that what is available now is adequate.

Mr. EVANS. I question the seeming fact that very few midair collisions or near misses occur in the evening hours or at night time. Most seem to occur in the daylight hours. Is there something that could be done to make aircraft more visible during the daylight hours?

I suppose one thing I am thinking of is the lights on aircraft, the strobe lights, for example. Is that a possibility to use something like that in the daylight hours?

Mr. BOND. We do have some techniques that we use now. We require the turn-on aircraft landing lights, for example.

Mr. EVANS. I am not sure the landing lights would be of much help unless you are directly in front of the aircraft.

Mr. BOND. It is a big help to our controllers to see the aircraft in space——

Mr. EVANS. I am speaking possibly of other aircraft in the vicinity seeing the aircraft. It would seem that through the addition of something such as a strobe light it might be possible to create better visibility for aircraft with one another.

Mr. BOND. We have gone through a lot of sequential steps on this subject as have the manufacturers. We have looked into luminescent paint and various things like that. The final conclusion is, incidentally, that it doesn't make all that much difference.

We have installed increased power and lighting systems, including strobes, rotating beacons, and various other devices to achieve just that effect and purpose.

Mr. EVANS. But they are not used during the daylight hours, are they?

Mr. BOND. Generally not.

Mr. EVANS. Mr. Chairman, it would seem that would be one of the easiest things we could do to increase the visibility of aircraft, especially in crowded areas and during daylight hours.

Mr. BOND. Congressman, I guess I was not very well briefed on the subject. Perhaps we could send you something after the hearing or ask Joe Ferrarese of Flight Standards.

Mr. EVANS. I would like to have a more detailed answer on this, specifically, why a procedure such as strobe lighting is not used on aircraft during daylight hours, especially in crowded air traffic areas? Utilizing such a procedure would seem to me a cheap mechanism to resolve an immediate problem until we have effective long-range solutions.

Mr. BOND. We will get something to you to tell you what we are doing on that.

Mr. EVANS. I will appreciate that.

Mr. BURTON. Without objection, the record will be left open at this point for the purpose of inserting this additional material.

[The material follows:]

Cockpit Visibility

All transport airplanes currently operated by certificated carriers comply with Part 25 of the Federal Aviation Regulations or its predecessor regulation Part 4b of the Civil Air Regulations. The requirements on pilot compartment view are set forth in Section 25.773 (Section 4b.351). Simply stated, the rule requires adequate vision to enable the pilot to safely perform any maneuver within the operating limitations of the airplane including taxiing, takeoff, approach and landing during nonprecipitation conditions. For precipitation conditions, the requirements are for a means to maintain a clear portion of the windshield to provide sufficently extensive vision along the flight path, in normal flight attitudes, for both pilots.

The FAA would like to obtain as much cockpit visibility as possible. However, there are a number of conflicting design objectives that limit the amount of visibility that the designer can provide in the airplane. These conflicting design objectives involve instrument size and location, structural integrity of the framework about the windshield, possibility of explosive decompression because of failure of the windshield, and distortion of the pilot view through the windshield. In this regard, we believe that all the above design factors including cockpit visibility are near optimum in U.S. transport airplanes. Any tradeoff to obtain greater visibility would have some adverse effect on the other factors.

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EXTERIOR LIGHTS

USAF ASD Strobe Light Evaluation, Technical Report ASD-TR-77-33, dated June 1977. The FAA has reviewed the ASD report and is in general agreement with their findings, conclusions, and recommendations.

FINDINGS:

The report states, "Strobe lights will not significantly reduce the potential for mid-air collisions involving Air Force aircraft. The visibility enhancement characteristics of the strobe light when compared to the mid-air threat environment, offer very little, if any, added protection against mid-air collisions.

CONCLUSION:

The report concludes that:

"(a) Analysis fails to support high intensity strobes for the reduction of the daytime mid-air collision potential with present day technology.

(b) Further action to develop a strobe light specification for daytime mid-air collision avoidance is not warranted at this time.

(c) Some strobes, optimized for night visual intensity levels, may be appropriate if they can be shown to be life-cycle-cost effective.

(d) Strobe lights used in conjunction with electronically aided detection devices may provide a viable collision avoidance system and should be investigated as a future task."

RECOMMENDATION:

The report recommends:

"(a) Continue selective installation of strobe lights optimized for night visual intensity when a life-cycle-cost savings can be realized.

(b) Future work should address the mid-air collision problem from a system point of view. This approach will allow consideration of high intensity lighting, coupled with electronically aided detection as part of the overall solution to the Air Force's mid-air collision problem."

The FAA does not have an active strobe light research program. We are monitoring the military efforts for possible use of the results in civil aviation.

Anticollision Lights. Anticollision lights are required on each aircraft for VFR flight at night and for IFR flight. When installed, the anticollision lights must meet the applicable airworthiness requirements concerning location, field of coverage, flashing characteristics, and intensities.

There are no requirements in the FAR as to when the anticollision lights must be lighted. However, in the FAA's "Airman's Information Manual, Basic Flight Information and ATC Procedures," under "Good Operating Practices," Page 117, is the statement that the FAA has recommended to air carriers/commercial operators that they establish procedures for the Operation of the aircraft rotating beacon (anticollision lights) any time the engines are in operation. Also, general aviation pilots utilizing aircraft equipped with rotating beacon (anticollision lights) are encouraged to participate in this program and operate the lights any time the engines are in operation.

Position Lights. Position lights are not required for type certification. However, position lights are required on each aircraft for VFR flight at night and for IFR flight. When installed, the position lights (forward and rear) must meet the applicable airworthiness requirements concerning location, color, light covers and filters, dihedral angles, light distribution, and light intensities.

No person may, during the period from sunset to sunrise (separately defined for Alaska), operate an aircraft unless it has lighted position lights (§91.73).

Landing Lights. Landing lights are not required for type certification. However, for VFR flight at night and for IFR flight, one approved landing light is required (§91.33) on each aircraft operated for hire. When installed, the landing light must meet the applicable airworthiness requirements concerning glare, halation, and enough light for night landing. Also, for transport category airplanes, there must be means to indicate to the pilots when the landing lights are extended.

Mr. BURTON. I have two more questions before we get on to certification.

As I understand it, this study that was finished in 1978 on BCAS was based on two pieces of equipment, two pieces of active-passive equipment. That equipment is now at NAFEC. There was a proposal to have these two sets sent down to NASA where they could test them in the advanced TCV aircraft. Am I correct so far?

Mr. ALBRECHT. No.

Mr. BURTON. If I am correct, the zinger is that FAA halted that.

Mr. ALBRECHT. As far as I know, Mr. Chairman, we have not received a formal request from NASA or anybody else for that equipment. I understand that there have been discussions with NASA that we were not a direct party to.

Mr. BURTON. How about the Administrator?

Mr. ALBRECHT. Nor the FAA, as far as I know.

Mr. BURTON. How about as far as anyone else knows?

Mr. ALBRECHT. Let me finish.

Given such a request, we would certainly take a look at the intent of the use of that equipment versus our use for it and try to come to some conclusion on where it can best be used.

Mr. BURTON. Wouldn't it make sense to have them do some of this testing for you if one of your problems is trying to work some kinks out of this equipment and make it work?

Mr. ALBRECHT. We do have a number of joint programs with NASA. One program is to evaluate the cockpit display situation, for example. We do work very closely with them on that. We use their test aircraft—their TCV aircraft.

Mr. BURTON. Why don't you do this. We can find out from NASA. I would suggest that if they are interested in running tests, it would be beneficial to you and the public that you do it or explain just why you don't want to do it.

Mr. ALBRECHT. That seems reasonable.

Mr. BURTON. I have one last thing on the point that Mr. Hightower raised and which was also raised yesterday regarding the emergency air situation. You chose San Francisco–Oakland. Do they both have the same regular frequency?

Mr. TIGNER. No, sir.

Mr. BURTON. Wouldn't it be possible for them to have a different emergency frequency?

Mr. TIGNER. There is only one emergency frequency.

Mr. BURTON. I know that. In other words, there is only one for the whole country?

Mr. TIGNER. The aircraft equipment would have to be somehow modified to accommodate that kind of thing. I guess I don't know the technical aspects of how you would modify it. By the ICAO rules, there is only the one emergency. Now you could perhaps have some alternate——

Mr. BURTON. Why do you think there is no need for the point raised by Mr. Hightower? It just seemed to make common sense. Maybe you could see if there could be an emergency frequency for each airport. If you had to have one for the bay area, I would think that even then the odds would be that you wouldn't find two aircraft at the same time on an emergency frequency.

You may have a freak situation where there is a communications gap but I would assume that odds of that happening at the same time at two approximate airports would be even more farfetched than you seeing a need for it at all.

What is your title?

Mr. TIGNER. I am the Acting Air Traffic Service Director. That includes all of the control towers, all the other traffic controls centers, all the flight service stations——

Mr. BURTON. All of the safety aspects of that?

Mr. TIGNER. The control of the aircraft, yes, sir.

While we are looking at it for Mr. Hightower——

Mr. BURTON. Well, we will consider that a full subcommittee request, made at the direction of Mr. Hightower, because this did come up yesterday.

OK. With regard to the certification issue, and then the "Cockroach Corner," issue——

Mr. BOND. Mr. Chairman, I would like to ask my colleagues to come up at this point.

Mr. BURTON. OK.

Mr. BOND. Mr. Chairman, you touched on two issues—certification, and the part 91 operations in Miami. Which do you want? We have a group of people.

Mr. BURTON. We want them both.

Mr. BOND. Which one do you want first?

Mr. BURTON. Whom do you have sitting there?

Mr. BOND. These people handle the certification.

Mr. BURTON. Very well.

Mr. BOND. Let me introduce the folks who are with me here.

On my far left is Joe Ferrarese who is acting head of our Flight Standards Service. Clark Onstad is our Chief Counsel. Chris Walk is Director of the northwest region of the FAA which has Boeing in its purview. And Craig Beard is the Director of Flight Standards for the western region where the Douglas Aircraft Corp. and so many of the aerospace industries in southern California are located. Jim Robinson is also here. He is directly behind me, and he is also from Flight Standards.

Mr. BURTON. As I understand the certification process you have the FAR's, which are created through the regular rulemaking processes, and include public hearings, et cetera.

Mr. BOND. Did you direct that my statement on this subject be put in the record?

Mr. BURTON. Yes, I did.

Mr. BOND. Thank you very much.

Mr. BURTON. What is the capacity of an advisory circular as it applies to FAR's?

Mr. ONSTAD. The distinction, Mr. Chairman, is this. An FAR, which is a regulation, is mandatory. An advisory circular is not mandatory. It is merely one way of achieving the desired result, and it is a way which has been looked at in depth by the FAA and is suggested by the FAA as a way of achieving a result. It is in no way mandatory, and the applicant has all the discretion in the world to come up with another methodology of achieving compliance with the regulations.

Mr. BURTON. And do not the circulars sometimes also do that—provide the options? In other words, as we understood it yesterday, you issue the regulations, and the circular provides them with the ways to meet the regulations.

Mr. ONSTAD. The circular gives you one method. It may have more than one method. But in no way are you precluded from coming up with another method.

Mr. BURTON. It then needs prior approval by you?

Mr. ONSTAD. The new method which would be submitted, which does not include the advisory circular, would be thoroughly looked at by the FAA before we would allow it to be used—yes, sir.

Mr. BURTON. Is not the process by which the circulars are used as important as that involving the regulations?

Mr. ONSTAD. No, sir. I do not think they are as important as the regs. The regulations are the foundation, for example, of the certification process, and they are something which is enforceable as a matter of law. The advisory circular is not enforceable as a matter of law——

Mr. BURTON. No; but it shows you how you can meet the standards set by the regs?

Mr. ONSTAD. It shows you one way to meet the standards—yes, sir.

Mr. BURTON. Probably the most desirable, at least in your mind?

Mr. ONSTAD. One of the desirable ways, Mr. Chairman.

Mr. BURTON. Is it cited as a basis for certification?

Mr. ONSTAD. I am sorry—I do not understand the question.

Mr. BURTON. You issue a reg, and you issue an advisory circular. Is that circular cited and used as a basis for certification—that if they meet that circular, or its equivalent approved by you——

Mr. ONSTAD. May I restate the question in order to make sure I understand it?

Mr. BURTON. Yes.

Mr. ONSTAD. If you are saying that we permit an applicant for certification to offer the technique which is set forth in the advisory circular as a means of complying with a particular regulation, then the answer to your question is yes, sir.

That may serve as part of the certification basis.

Mr. BURTON. Is the same thing true of a notice?

Mr. ONSTAD. What type of a notice? We have many, many notices in the FAA.

Mr. BURTON. Such as the notice 8400.18 entitled "Category 3(a) operations with airplanes equipped with fail-passive automatic landing systems."

Mr. ONSTAD. Mr. Ferrarese is well versed in fail-passive autolandings. I would like to refer to him on that question.

Mr. BURTON. Well, with that type of notice, for instance.

Mr. FERRARESE. I would like to speak to that notice, Mr. Chairman.

Mr. BURTON. Well, could you speak to the general question—that type of notice?

Mr. ONSTAD. I am sorry, Mr. Chairman. Without having read the notice, I cannot answer your question.

Mr. BURTON. Are there any types of notice that have such standing that they are used for purposes of meeting certification requirements?

Mr. FERRARESE. No; offhand, we do not know of any. Would you like me to speak to that notice?

Mr. BURTON. All right. Why not speak to this notice briefly.

What was the strength or legality of this notice?

Mr. FERRARESE. Mr. Chairman, approximately 1½ years before that notice was issued, we developed criteria for the operation of category IIIA autolanding systems of a fail-passive type. They were sent out to all the users, including the Air Line Pilots Association, for comment.

At the time we sent those criteria out for comment, we were undecided whether to put it in the existing advisory circular—AC120–28A—because we were concurrently developing criteria for the use of wide-bodied jets with fail-operational systems at category II locations. Until we were ready to go out with those criteria, we decided to initially go out with the interim standards for the fail-passive system.

After we received the comments from all the users, we were still not ready to amend AC120–28A. We thought it would be expeditious to go out with a notice which outlined almost precisely the same criteria which we had coordinated with the industry and the Air Line Pilots Association.

Mr. BURTON. So in this instance, that notice was used almost like an advisory circular or a regulation? You did not have a regulation covering this at that time?

Mr. FERRARESE. Not at that time.

Mr. BURTON. Did you have a regulation covering this?

Mr. FERRARESE. Let me explain how the regulations enter into it. Part 25 deals, in addition to the certification of aircraft, with certification of aircraft appliances and equipment. Obviously, there are many appliances and equipments that new technology will develop, and we cannot possibly foresee all of them. So, we cannot include all of them in the regulations. They are dealt with in a general manner under part 25.

Mr. BURTON. In what kind of general manner? In notices and advisory circulars?

Mr. FERRARESE. No, sir, in the rules. Part 25 is an air worthiness certification rule.

You must remember that the FAA publishes instrument approach procedures at many, many airports. The FAA establishes the lowest weather minima that can be authorized for operation at that facility.

In part 121 of the Federal Aviation regulations, there is a rule that prohibits an airline from utilizing any weather minima unless specifically approved by the FAA. Before approving an airline for low weather minima, there are many things they have to do. It is not just the certification of airborne equipment. They must have additional pilot training, pilot proficiency, operational procedures, maintenance standards, and the ground facilities must be acceptable for that type of minimum. That notice, therefore, includes not only that which is required for certification of the equipment but also that which is required for the certification of that air carrier.

Mr. BURTON. What section of the FAR's do you use in approving fail passive autoland systems?

Mr. FERRARESE. I do not know the specific number, but it is in part 25 and deals with appliances and equipment.

Mr. BURTON. That is the general one?

Mr. FERRARESE. Yes. In addition to that, we have published advisory circulars that deal with automatic landing systems. There is advisory circular 20–57 which was later revised by advisory circular 20–57A. This advisory circular outlines the standards by which an automatic landing system may be approved, whether it be fail passive or fail operational. It makes no difference.

Mr. BURTON. What kind of public input is there into these advisory circulars?

Mr. FERRARESE. Generally, all weather minima advisory circulars are coordinated with all interested parties, including the Air Line Pilots Association.

Mr. BURTON. Mr. Butterworth?

Mr. BUTTERWORTH. Thank you, Mr. Chairman.

Mr. Ferrarese, correct me if I am wrong. The advisory circulars you are referring to specify equipment requirements, both airborne and ground, for landings in categories II and III weather conditions.

As I understand it, there is no specific FAR for the certification of fail-passive autolanding systems for category III-A weather. Am I right in that statement?

Mr. FERRARESE. There is no specific FAR for——

Mr. BUTTERWORTH. I understand there are other ones which can encompass it.

Mr. FERRARESE. Well, yes. There are no FAR's that deal with a fail operational system either.

Mr. BUTTERWORTH. OK.

The visibility conditions for which you approve the fail-passive autoland system to be used violate, in a way, the definition of category III weather, in that you have a 50-foot decision height. Is that right?

Mr. FERRARESE. Not necessarily. I would like to explain how the definitions came about. In the early 1960's, ICAO established an All-Weather Operations Panel. That panel defined the various categories of all-weather operations—category I, category II, and category III, which is subdivided into A, B, and C.

Mr. BUTTERWORTH. OK.

Mr. FERRARESE. I realize that in the definition of ICAO category III–A is without decision height and with 700 RVR—runway visual range. However, having a decision height makes it more conservative. As a matter of fact, the French and the British have used a decision height——

Mr. BUTTERWORTH. I understand what you are saying. We can touch on that later, and it is legitimate.

But do the current advisory circulars create a standard for certifying a fail passive autoland system?

Mr. FERRARESE. Advisory circular 20–57, which was met by the Boeing 727 autolanding system—the fail passive system which I believe you are talking about—does not talk about fail passive or fail operational. It deals only with the airworthiness certification of the equipment, the performance that is expected of it, and so on.

Mr. BUTTERWORTH. As the advisory circulars did not address that particular system, you put out an order—Notice 8400.18. It says, "This notice provides criterion guidelines for approval of category III–A

minimums at categories II and III ILS locations with suitably equipped airplanes—DC–9's, 737's, 727's." You note that the criteria are interim in that the advisory circulars which you reference will be amended at a later date.

In essence, it seems to me, and this is not a criticism of any of the standards, that this is the document right now the fail passive autolanding system is certified against.

Mr. FERRARESE. No, sir. That is not correct. You said that document referred to the advisory circulars that I had referenced.

Mr. BUTTERWORTH. It references advisory circulars.

Mr. FERRARESE. It is Advisory Circular 120–28A which was to be amended. It was later amended, soon after that publication. It is now AC120–28B. It contains not only the criteria for fail passive——

Mr. BUTTERWORTH. All right.

Let me ask the question this way. We are going to confuse everyone with all the numbers.

Why is there not a specific FAR governing the certification of the fail passive autoland system?

Mr. FERRARESE. We will do this in time, but the regulatory process is a long, laborious thing. If you consider every single appliance that could be put into an airplane——

Mr. BURTON. What is the definition of "appliance?" Does that include a stove that heats food?

Mr. FERRARESE. No, sir. The appliances that I am referring to are airborne equipment—autopilots, and so on.

Mr. BUTTERWORTH. These are important pieces of equipment. They are not insignificant.

Mr. FERRARESE. They are important.

Mr. BUTTERWORTH. Your position is that an FAR may be developed at some point? Did anyone ever petition the FAA to create an FAR?

Mr. FERRARESE. Yes.

The Air Line Pilots Association, during our operations review conference, petitioned the FAA to consider placing in part 121 all the requirements for all-weather operations. I do not think they specifically dealt with a fail passive system. I am not sure.

Mr. BUTTERWORTH. Mr. Chairman, I would like to enter into the record at this point a March 13, 1975, letter from Capt. J. J. O'Donnell to then Administrator Alexander Butterfield, formally requesting under section 11.25, "Petitions for Rulemaking or Exemptions," to establish through public rulemaking procedures, regulations which incorporate criteria for category I, II, and III instrument landing operations and associated airborne systems.

Mr. BURTON. Without objection, it will appear in the record at this point.

[The material follows:]

March 13, 1975

Mr. Alexander P. Butterfield
Administrator
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, DC 20591

Dear Mr. Butterfield:

The Air Line Pilots Association hereby petitions the Federal Aviation Administration under Subchapter B, Part 11, Section 11.25 "Petitions for Rule Making or Exemptions" to establish, through public Rule Making procedures, regulations which incorporate criteria for the approval of Category I, II, and III instrument landing operations, including criteria for the establishment of appropriate landing weather minima, as well as criteria for the approval of the associated airborne systems.

We believe it to be contrary, not only to the public interest, but also contrary to the provisions of Section 553, Chapter 5 (Administrative Procedure), Title 5, U.S.C., to permit such crucial flight safety criteria to be established without benefit of adequate public participation in its formulation.

We also believe that continued use of Advisory Circular criteria, such as that contained in AC 20-57A, AC 120-28A, AC 120-29, as a substitute for regulations, circumvents the provisions of Section 553, Chapter 5, Title 5, U.S.C., and can result in less than an adequate level of operational safety.

Sincerely,

J. J. O'Donnell, President

JJO'D:gw
cc: Office of the General Counsel, DOT
Office of the Chief Counsel, FAA
James F. Rudolph
Richard P. Skully

bcc: All Weather Flying Committee
TERPS Committee
J. W. Meek, D. L. Baker

Mr. BUTTERWORTH. As far as the documentation goes, the FAA apparently sat on this until Senator Cannon, in a letter dated August 15, 1975, requested the FAA to determine what it would do with the petition.

Supporting data were included, and this will all go into the record.

That petition for rulemaking was denied.

What I am trying to establish here is this. Mr. Bond, in his opening statement, and IAI, and ATA, stressed that the certification process is open because you create regulations through public rulemaking procedures.

Here is an organization which attempted to have a Federal air regulation created for a system about which it was concerned, and it was denied that opportunity. So, instead, what we have got is union action to prevent the system from being used.

Mr. FERRARESE. Mr. Butterworth, the petition, as I recall it, did not deal specifically with a fail passive system. You must remember that we do now have, and have had for some time, three widebodied jets with fail operational autoland systems that have been operating to category III–A minimums. We received no such petition to include that in the regulations specifically.

Mr. BUTTERWORTH. Who was the person who would have made the decision on this particular request?

Who is supposed to review a petition for rulemaking to part 25 once it is assigned a docket number?

Mr. FERRARESE. In flight standards, the director of flight standards would be the one responsible.

Mr. BUTTERWORTH. It would have been Mr. Skully at that time?

Mr. FERRARESE. Yes.

Then the Chief Counsel's office would prepare the denial or the grant. The disposition of petition for rulemaking must be signed by the Administrator.

Mr. BUTTERWORTH. Then I would like to submit these items for the record.

Unless I am reading them incorrectly, it appears that the petition was ignored until some sort of senatorial pressure was exerted, and only then were they commented on.

Mr. BURTON. Without objection, they will appear in the record at this point.

[The material follows:]

Attorneys and Counsellors At Law
Suite 504
3251 Old Lee Highway
Fairfax, Virginia 22030

August 5, 1975

The Honorable Howard Cannon
United States Senate
Washington, D. C. 20510

Dear Senator Cannon:

On June 3, 1975, the attached petition was included as an attachment to prepared testimony presented to the U. S. Senate Committee on Appropriations, Subcommittee on Transportation, concerning the FAA's fiscal year 1976 budget estimates. The petition, dated March 13, 1975, requests the FAA implement public rulemaking action to establish regulations which incorporate criteria for the various categories of instrument landing operations.

I am interested in determining the status of this petition, but have been unable to locate it in the FAA's public docket for rulemaking. I believe it is customary for such petitions to be recorded in the docket to provide the public an opportunity to examine and comment on such important safety regulatory matters.

I respectfully request assistance in obtaining information from the FAA regarding the disposition of this petition.

Sincerely yours,

Charles T. Leighton

CTL/ajl

INFORMATION

August 15, 1975

The Honorable James F. Dow
Deputy Administrator
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D. C. 20590

Dear Administrator Dow:

Enclosed is a letter from Mr. Charles T. Leighton of Fairfax, Virginia inquiring about the FAA's docketing of a proposed rulemaking submitted by the Air Line Pilots Association. I would appreciate your review of the question raised in his letter and providing me a prompt response.

Sincerely yours,

HOWARD W. CANNON, Chairman
Aviation Subcommittee

HWC:bgm

Enclosure

cc: Mr. Charles T. Leighton

6251
8-13-75
ICD: 8-5-75
cc: Mr. Charles T. Leighton

United States Senate

Howard W. Cannon
U.S.S.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20590

OFFICE OF
THE ADMINISTRATOR

OCT 1 1975

Honorable Howard W. Cannon
Chairman, Subcommittee on Aviation
Committee on Commerce
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

Your August 15 letter asks me to review Mr. Charles T. Leighton's question about the Federal Aviation Administration's (FAA) docketing of the March 13 petition for rulemaking submitted by the Air Line Pilots Association (ALPA).

My office received the ALPA petition on March 16. The same day, we delivered it to Flight Standards Service for appropriate action. The Flight Standards Air Carrier Division conducted a review of the petition. On April 8, the Chief of that Division wrote Mr. O'Donnell, President of ALPA (copy enclosed). He advised ALPA that we did not believe rulemaking was necessary and he asked them for additional information to support the amendment they proposed. The petition was not docketed pending receipt of that information from ALPA.

When we received your inquiry, the petition and our initial response were filed in Docket No. 14979. Since our April request, however, we have not received any further information from ALPA on the matter. My staff will again contact ALPA and final action will be taken to finally dispose of the matter. We also are filing a copy of your letter, Mr. Leighton's letter and this response in Docket No. 14979.

We trust this information will assist you in responding to Mr. Leighton.

Sincerely,

Original Signed By:
J. W. Cochran

Acting Administrator

2 Enclosures:
FAA's response to Mr. O'Donnell
Constituent's Correspondence

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

April 8, 1975

Mr. J. J. O'Donnell
President
Air Line Pilots Association
1625 Massachusetts Avenue, N. W.
Washington, D. C. 20036

RECEIVED
APR 10 1975
PRESIDENT'S DEPT.

Dear Mr. O'Donnell:

In your March 13 letter to the Administrator you petitioned to have the advisory circular criteria for approval of Category I, II, and III operations included in the regulations.

We appreciate your interest in this matter; however, we do not agree that the Administrative Procedures Act has been circumvented or that flight safety criteria was established without public participation. As a matter of fact, these advisory circulars were coordinated with all interested segments of the aviation industry who could make constructive contributions in establishing criteria for Category I, II, and III operations.

Current regulations (FAR 121.567) state that no person may make an instrument approach at an airport except in accordance with IFR weather minimums and instrument approach procedures set forth in the certificate holder's operations specifications. When an operator complies with the appropriate criteria in the advisory circulars, which is one means but not the only means of compliance, operations specifications can be issued. Accordingly, we do not believe that the proposed rulemaking action is necessary.

We will not take any further action on your petition unless we receive additional information to support why the proposed amendment is in the public interest.

Sincerely,

C. A. McKAY, Acting Chief
Air Carrier Division
Flight Standards Service

AIR LINE PILOTS ASSOCIATION
1625 MASSACHUSETTS AVENUE, N.W. □ WASHINGTON, D.C. 20036 □ (202) 797-4000

July 13, 1977

The Honorable Langhorne M. Bond,
Administrator
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, DC 20591

Dear Mr. Bond:

This is in reference to my Petition, on behalf of the Air Line Pilots Association, for rule making concerning Category I, II and III operations, landing weather minima and associated airborne systems, submitted on March 13, 1975, in a letter to Mr. Alexander Butterfield, then Administrator of FAA.

On April 8, 1975, Mr. Curtis A. McKay, then Acting Chief, Air Carrier Division, Flight Standards Service, responded to my Petition, treating it simply as a request "to have the advisory circular criteria for approval of Category I, II and III operations included in the regulations." Mr. McKay was in error in presuming that the Association was seeking the inclusion of the advisory circular criteria in the regulations, and his letter failed to address the remainder of my Petition calling for rule making concerning landing weather minima, and associated airborne systems. Nevertheless, the following additional information is submitted for your consideration of my Petition in its original form.

In his response of April 8, 1975, Mr. McKay contended that the pertinent advisory circulars were coordinated with all interested segments of the aviation industry who could make constructive contributions in establishing criteria for Category I, II and III operations, and that the performance of these operations must conform to the carriers' operations specifications, which may, in some cases, be based on the criteria in the advisory circulars. Based on the foregoing reasoning, Mr. McKay concluded that the FAA had not circumvented the Administrative Procedure Act requirement of public participation and that there was no need to take further action on our Petition absent "additional information to support why the proposed amendment is in the public interest." Notwithstanding Mr. McKay's opinion, we believe that he is mistaken when he states that FAA has complied with the Act.

First, Mr. McKay concedes that compliance with the advisory circular criteria is only one way in which Operations Specifications of the carriers can be issued. Since the advisory circular criteria are not mandatory, we have a situation characterized by a lack of standardization in which different FAA Regional Offices can approve varied operational procedures, landing weather minima and airborne systems of the carriers subject to their respective jurisdictions. We, and others in our industry, are convinced that a

proliferation of individualized requirements in the area of low visibility landings is not safe, and that what is needed are regulations which set up uniform minimal standards which are mandatory and therefore not subject to alteration and variation by different carriers and FAA personnel with varying notions of what is required for Category I, II and III operations.

Next, we take issue with the contention that the FAA has adequately coordinated the criteria for these operations with all interested segments of the industry. The following chronology evidences my point:

August 28, 1973 - An informal industry-wide meeting called by the FAA was held to discuss a proposal to allow Category IIIa operations on Category II facilities for certain types of jet transport aircraft equipped with a fail-passive autoland system.

August 13, 1975 - The FAA invited comment on certain "tentative requirements" which the FAA was "considering authorizing." The effect of authorizing these tentative requirements would have been to authorize the operations discussed at the 1973 meeting.

October 7, 1975 - The FAA advised ALPA of certain events which had convinced the FAA that the "tentative requirements" would provide a safe operating basis.

November 5, 1975 - Key personnel of the FAA Flight standards Office, Washington, D.C. held a meeting in Long Beach, California with representatives of Boeing, Douglas and Lockheed to discuss the subject covered by the "tentative requirements." ALPA was not invited to attend the meeting, and was not notified that it was to take place.

October 20, 1976 - The former "tentative requirements" reappeared as "interim criteria" in FAA Notice N8400.18, a document whose official distribution was limited to FAA offices. This internal FAA Notice stated that these "interim criteria" were interim "only in the sense that Advisory Circular 120-28A will subsequently be revised to reflect these requirements." Furthermore, and in contravention of the criteria in Advisory Circular 120-28A, the Notice authorized principle operations inspectors to approve operations meeting these "interim criteria."

March 25, 1977 - The FAA advised us the Advisory Circular 120-28A "will be revised to reflect these requirements" (i.e., the requirements in N8400.18).

Late 1975 to present - Our subsequent requests to examine the substantiating data used by the FAA as a basis for validating the operation authorized by N8400.18 have been rejected by the FAA for "proprietary" reasons.

As you can see, the criteria for Category II and III operations have been amended in a fashion which bears no resemblance to the traditional and statutorily required rule making process. No docket was established, notice was not published, and the comments of all interested persons were not solicited in all stages of the preparation of the so-called "interim criteria." Indeed, ALPA was not invited and was not aware of the November 5, 1975 meeting in Long Beach which preceded the issuance of the "interim criteria."

The reliance upon advisory circular criteria in this instance is an example of the FAA's use of such circulars as substitutes for rule making and regulations, a practice to which we have objected for some time. We appreciate the fact that not all standards or criteria need be or should be regulatory. The use of advisory circulars for internal guidance is understandable, but not in areas such as Category I, II and III operations which demands uniformity for the sake of safety. I urge you, in the public interest, to act upon my Petition for rule making as set forth in my letter of March 13, 1975, and to enter this letter and the enclosures herewith into Docket No. 14797.

Sincerely,

J. J. O'Donnell, President

JJO'D:smd

Enclosures: March 13, 1975 letter from Captain O'Donnell to Mr. Butterfield
April 8, 1975 letter from Mr. McKay to Captain O'Donnell
August 5, 1975 letter from Mr. Leighton to Senator Cannon
August 13, 1975 letrer from Mr. McKay to Captain O'Donnell
August 15, 1975 letter from Senator Cannon to Mr. Dow
September 19, 1975 letter from Dr. Phaneuf to Mr. McKay
October 1, 1975 letter from Mr. Cochran to Senator Cannon
October 7, 1975 letter from Mr. McKay to Dr. Phaneuf
October 20, 1976 FAA Notice N8400.18
March 25, 1977 letter from Mr. McKay to ALPA

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

OFFICE OF THE ADMINISTRATOR

JUL 25 1977

RECEIVED
JUL 27 1977
PRESIDENT'S DEPT.

Mr. J. J. O'Donnell
President
Air Line Pilots Association
1625 Massachusetts Avenue, NW.
Washington, D.C. 20036

Dear Mr. O'Donnell:

This is in reply to your July 13 letter concerning ALPA's March 13, 1975, petition for rulemaking. That petition requested the establishment of regulations "which incorporate criteria for the approval of Category I, II, and III instrument landing operations, including criteria for the establishment of appropriate landing weather minima, as well as criteria for the approval of the associated airborne systems."

The FAA has, for many years, issued advisory circulars establishing criteria for obtaining operational approvals such as lower weather minima. These circulars are not regulatory in nature; they provide criteria which may be used to obtain necessary FAA approval. Those pertaining to lower weather minima in each case were fully coordinated with the aviation industry, as was the substance of Appendix 1 of Notice 8400.18. Accordingly, we do not agree that these advisory circulars were issued contrary to the Administrative Procedures Act.

We do not agree that there is a lack of standardization in approval of low weather minima and airborne systems. On the contrary all initial Category II approvals were granted only after review by Washington Headquarters. The same is true of Category IIIa approvals. With respect to airborne systems, there are basically only two regions involved, the Western and Northwest Regions. Therefore, standardization should not be a problem.

I would like to briefly comment on the November 6, 1975, meeting at Long Beach, California. Since this meeting was held at the request of the airframe manufacturers, it would not have been appropriate for FAA to invite other aviation segments. ATA was also not present at the meeting. The purpose of this meeting was not to discuss the "tentative requirements" but to explore the feasibility of applying them to wide-body airplanes. Nothing discussed at this meeting had any bearing on the criteria contained in Appendix 1 of Notice 8400.18.

We will assume that your letter contains the additional information requested in Mr. McKay's letter of April 8, 1975, and, therefore, will act on your petition. Your letter has been placed in docket 14979.

Sincerely,

Quentin S. Taylor
Acting Administrator

AIR LINE PILOTS ASSOCIATION
1625 MASSACHUSETTS AVENUE, N.W. □ WASHINGTON, D.C. 20036 □ (202) 797-4000

July 18, 1978

Federal Aviation Administration
Office of Chief Counsel
800 Independence Avenue, S.W.
Washington, D.C. 20591

ATTN.: Rules Docket AGC-24, Docket No. 14979

Gentlemen:

The following correspondence is provided for enclosure in Docket Number 14979:

- Letter dated January 26, 1978, ALPA to FAA. ALPA response to FAA explanation of the reason for the issuance of the DC-10 airworthiness directive.
- Letter dated January 16, 1978, FAA to ALPA. FAA response to ALPA's concern regarding an airworthiness directive against the DC-10 fail-operational landing system.
- Letter dated January 6, 1978, ALPA to FAA. ALPA comments on fail-passive and fail-operational autoland system operations.
- Letter dated July 7, 1977, FAA to ALPA.
  FAA assurance that no authorization for Category IIIa operations with fail-passive autoland systems will be given until all safety requirements have been satisfied.
- Letter dated July 21, 1977, FAA to ALPA.
  FAA response to ALPA questions on fail-passive autoland operations.
- Letter dated September 16, 1977, ALPA to FAA.
  Described problem areas concerning Category IIIa operations with fail-passive autoland systems.
- Letter dated October 25, 1977, ALPA to FAA.
  ALPA analysis of FAA fail-passive autoland system flight test data.

/continued/

- Letter dated October 27, 1977, ALPA to FAA
  Comments on changes to Operations Specifications regarding fail-passive autoland systems.
- Letter dated December 16, 1977, ALPA to FAA
  Analysis of operational experience gained with fail-passive autoland system in Category IIIa air carrier operations.
- March 25, 1977 letter from Mr. McKay to ALPA
- October 20, 1976 FAA Notice N8400.18
- October 7, 1975 letter from Mr. McKay to Dr. Pahneuf
- October 1, 1975 letter from Mr. Cochran to Senator Cannon
- September 19, 1975 letter from Dr. Phaneuf to Mr. McKay
- August 15, 1975 letter from Senator Cannon to Mr. Dow
- August 13, 1975 letter from Mr. McKay to Captain O'Donnell
- August 5, 1975 letter from Mr. Leighton to Senator Cannon
- April 8, 1975 letter from Mr. McKay to Captain O'Donnell
- March 13, 1975 letter from Captain O'Donnell to Mr. Butterfield
- August 28, 1973 transcript of tape recording of FAA/Industry/ALPA Meeting

This material is provided to insure that all pertinent material is included in Docket No. 14979 since earlier correspondence referred in error to Docket No. 14797 and to show how the ALPA petition for rule making is in the public interest.

Sincerely,

E. V. Fretwell

E. V. Fretwell
ALPA Staff Engineer
Engineering & Air Safety Department

EVF/lm
Enclosure

Mr. BUTTERWORTH. The point I am trying to make is this. You do not always create an FAR. And to the extent that your argument rests on FAR's being easily arrived at, I do not know if the argument is really valid.

Mr. BURTON. In some instances, advisory circulars or internal orders have almost the effect on the certification process as does an FAR. At least they are certainly used in the consideration.

Would the FAA give their feelings on their being required to place a notice of such documents that do have an impact on defining certification standards in the Federal Register?

Mr. ONSTAD. Mr. Chairman, I would like to speak to that briefly.

From an administrative law point of view or from an administrative burden point of view, I do not see any particular problem. Obviously, it is really standardizing or codifying a process which largely goes on today.

I would like to draw on my most recent experience. That is the advisory circular on noise abatement procedures for takeoff. That has been circulated throughout the entire country for public comment, although it was not published in the Federal Register.

All I can say to you is that the procedure, itself, would not be objectionable, and it would standardize the process, which largely goes on today.

Mr. BURTON. Well, how does the Administrator feel about, either now or in a short time, committing himself to such a process?

As you said, the codification of the reg goes on today. The regs sometimes are policy statements and leave the industry open to exactly what does that mean? The circular really comes out and tells them what they have to do or even provides the option, as I think was shown by the industry using the most favorable that we all remember from the MLS situation where flight simulation would be the equivalent of actual flight testing, or vice versa.

So, I think they do have an impact on exactly how the certification process works, in many instances, because you just really further define it.

I wonder if the Administrator would comment? The industry saw no problem with this. How do you feel about noticing such things in the Federal Register?

Mr. BOND. Mr. Chairman, I would like to give you a response after I have checked with my associates in the Secretary's office.

I do not know whether we should be setting a precedent here, with which we have some difficulty. But I will give you a response to that promptly, if you will permit me to do so.

Mr. BURTON. All right. Thank you.

Without objection, the reply will appear in the record at this point.

[The material referred to above not received by time of printing; when received, will be retained in subcommittee files.]

Mr. BURTON. Also, we are only talking about the circulars and orders that are involved in the certification process and, really, are used as instruments of that process.

Mr. Walker?

Mr. WALKER. Mr. Chairman, I have no questions at this time.

Mr. BURTON. Mr. Evans?

Mr. EVANS. I have no questions, Mr. Chairman.

Mr. BURTON. Ms. Halterman?

Ms. HALTERMAN. I have no questions, Mr. Chairman.

Mr. BURTON. We will hear from Mr. Butterworth.

But, first of all, I have one question on DER's—the designated engineering representatives.

Could you provide for the record the following information: The standards and qualifications which the DER's must meet; the type of disciplinary action, if any, available to you in the event of misfeasance, malfeasance, or nonfeasance; and your procedures for auditing their performance?

Mr. BOND. We will certainly do that, Mr. Chairman.

Mr. BURTON. Without objection, the response will appear in the record at this point.

[The material follows:]

Designated Engineering Representatives (DER's)

The Federal Aviation Administration (FAA) has delegated certain of its functions to private persons and corporations to act as Representatives of the Administrator to assist in the type certification process. There are a number of different forms of delegations (designees) used by the FAA in both aircraft and airman certification. Two types of designees used in the type certification process are Designated Engineering Representative (DER's) and Designated Manufacturing Inspection Representatives (DMIR's). The authority to delegate functions of the Administrator derives from Title III, Section 314 of the Federal Aviation Act of 1958.

The extent of delegation is individually selective, depending on the person's knowledge of the regulations, and his education and past experience. Designees are considered to be highly qualified experts in their specialized field and are responsible persons of high integrity and high ethical standards. Designees are subject to training and supervision by the Regional Engineering and Manufacturing branches. Enclosed are Sections 195 and 196 of FAA Order 8110.4 which prescribe qualifications for DER's.

DER's are limited to conducting or witnessing tests and preparing, reviewing, and approving data only as needed by the FAA. DER's are not delegated functions in certain critical areas such as determination of compliance with basic loads and flight characteristics testing which are carried out by FAA personnel. DER's are not allowed to issue type certificates for aircraft, aircraft engines, or propellers. Final approval authority of these products under the DER System rests with the FAA.

DER's are audited as necessary to ensure that they are currently and adequately informed with respect to changes in policies, procedures, practices, regulations, and associated standards, and that they are accomplishing designee activities in an acceptable manner. The proportion of each DER's approved data to be reviewed or audited by the FAA and the depth thereof is proportional to the experience of FAA with the individual DER. Sections 203 (c) and (d) of Order 8110.4, which pertains to this issue, are enclosed.

Insofar as action that may be taken by the FAA against a DER, in accordance with Section 183.15 of FAA Order 8110.4, a DER designation is terminated upon a finding by the Administrator that the representative has not properly performed his duties under the designation or for any reason the Administrator considers appropriate. Further, a DER designation expires 12 months after the last day of the month in which it is issued and may be renewed only if a review of the performance of the DER is found to be satisfactory and the concurrence of all concerned is obtained.

Currently, there are approximately 800 DER's, approximately 650 of these are employed by manufacturers, and more than 500 DMIR's all of which are employed by manufacturers. This compares with a total of approximately 450 technical personnel directly employed by FAA who are currently engaged in the type certification process.

If the FAA were to discontinue the use of designees in the type certification process, it is obvious from the above that the FAA would have to increase its technical personnel significantly at considerable expenditure to the government and public. The use of designees in the type certification process is estimated to save the public 30 to 40 million dollars a year.

The designee system was first instituted in 1940, and the performance of the designee over these many years has been excellent with no developing trend or history of compromise of safety in favor of pecuniary corporate interests. We believe that the designee system is and has been very advantageous to the government, the public, and the industry. The designee system has reduced the cost of government to the general public. It has enhanced the manufacturer's ability to meet its certification and delivery schedules. These benefits have accrued without derogation of safety and reliability of our transportation system. The safety record of our certificated air carriers speaks for itself.

c. Systems and Equipment Engineering Representative - may, within the limits of his appointment, approve engineering reports, drawings, and data relating to phases of aircraft design not covered by structural or powerplant representatives provided these items have been determined to comply with pertinent FAR. He may also approve modifications to equipment including, but not all, equipment and systems other than those of a structural, powerplant or radio nature.

d. Radio Engineering Representative - may, within the limits of his appointment, approve engineering reports, drawings, drawing lists, test, and test data relating to the design and operating characteristics of radio equipment being manufactured and/or relating to the installation thereof, provided these items have been determined to comply with pertinent FAR; inspect prototype and production units submitted for certification to ascertain that their mechanical construction is in accordance with good practice; and approve modifications to equipment.

e. Engine Engineering Representative - may, within the limits of his appointment, approve engineering reports, drawings, and data relating to durability, materials, and processes employed in engine design, operation, and maintenance when these items have been determined to comply with pertinent FAR.

f. Propeller Engineering Representative - may, within the limits of his appointment, approve engineering reports, drawings, and data relating to durability, materials, and processes employed in propeller design, operation, and maintenance, provided these items have been found to comply with pertinent FAR.

g. Flight Analyst Representative - may, within the limits of his appointment, prepare and approve performance flight test data and quantitative operating and flight characteristics data.

h. Flight Test Pilot Representative- may, within the limits of his appointment, conduct any flight tests of both new and modified aircraft. The extent and conduct of the overall flight test program should be coordinated with the local FAA regional office prior to initiation of the flight test program.

195. QUALIFICATIONS.

a. All Designated Engineering Representatives must:

(1) Be in the employ of and recommended by the engineering consulting agency, manufacturer, air carrier, or certificated repair station. This does not apply in the case of self-employed individuals.

(2) Have a thorough working knowledge of the pertinent FAR.

(3) Have been in a responsible position in connection with the type of work for which he is to be designated and be entirely cognizant of related technical requirements and problems related to civil approval or have otherwise demonstrated his suitability for this designation.

(4) Possess integrity, sound judgment, and a cooperative attitude.

(5) Have a position in his employer's organization with sufficient authority to enable him to administer effectively the pertinent FAR. This does not apply in the case of self-employed individuals.

(6) Have at least one year of experience in direct contact with the FAA in which he was actively engaged in the processing of engineering work for FAA approval, of the type for which he is seeking appointment. His experience in obtaining FAA approvals must have been such as to enable the FAA to determine that the applicant is cognizant of the technical problems encountered in obtaining such approvals. The applicant's experience must also indicate to the FAA that he is technically competent to successfully solve the engineering problems within the scope of his designation and his presentations to FAA must have been satisfactory. Education in aeronautical, mechanical, civil, or electrical engineering successfully completed at a college or university of recognized standing may be substituted, year for year, for the eight years of experience required in subparagraph b of this paragraph to a maximum of four years. However, formal education may not be substituted for the one year of experience in direct contact with the FAA.

b. For engineering designees, except Flight Test Pilot Representatives, at least eight years of progressively responsible aeronautical, mechanical, civil, or electrical engineering experience or satisfactory combinations thereof as appropriate to the designation being sought is considered a minimum prerequisite for meeting the general qualifications of paragraph 195.a.(1) through (6). (The one year required in paragraph 195.a(6) may be included.)

c. For Designated Flight Test Pilot Representatives the following are considered minimum prerequisites for meeting the general qualifications of paragraph 195.a.(1) through (6):

(1) A currently valid commercial pilot's certificate, rated for instrument flying and the type of aircraft involved. (Instrument rating not required for helicopters.)

(2) A minimum of 2,000 solo flying hours (1,000 hours for helicopters) of which at least 100 have been logged within the past 12 months.

(3) A minimum [illegible]
in the type [illegible]

196. SELECTION AND APPOINTMENT.

a. Request for the appointment of [illegible] tive should be initiated [illegible] by FAA Form 1610, Statement of [illegible] DME), (see Figures [illegible] Manufacturing [illegible] for all designations.

b. This request will indicate [illegible] considered appropriate [illegible] each individual case.

c. This application will be [illegible] region which will conduct an investigation of the nominee, including a personal interview. [illegible] selection of a designee. The investigation is to encompass the approval of changes in the type design [illegible] certificates since he makes approval [illegible] of data. Only individuals who fully meet all [illegible] should be given this authorization.

d. If he is found to be satisfactory, a [illegible] will be issued to the nominee by the Chief, Engineering and Manufacturing Branch. Such designation is represented by [illegible] of Authority and by a Certificate of Designation [illegible]. (See Figures 5-3 and 5-4.) In order to eliminate the necessity for reissuing the FAA Form 2001 whenever there is a change in the [illegible] of designation, only the title "Designated Engineering [illegible] will appear on this form. The specific classifications [illegible] and limitations should be shown on the FAA form [illegible]. The designee will receive a kit, which contains regulatory and [illegible] information, and will be placed on the mailing list [illegible] material. The regional office will furnish [illegible] and the designee to receive any other necessary regulatory and technical information and the forms required in the performance of his delegated duties.

197. APPOINTMENT LIMITATIONS.

a. A qualified person may be appointed to act as more than one of the types of Designated Engineering Representatives listed in Part 183 of the Federal Aviation Regulations. He should be personally qualified to determine whether all the pertinent FAR coming within the scope of each of his designations have been complied with.

b. A designee may be appointed for or limited to specific types of work. For example, a designation may limit the representative to handling the approval of alterations to [illegible] model, to approving

☆ i. Certification Flight Hours.

(1) The recording of certification flight test time by the FAA flight test crew (pilot and/or engineer) should include all flights during which an FAA crew member is conducting required evaluations, including flight to and from local test areas, flight in the traffic pattern, etc. It also includes time required to conduct or witness systems evaluations and other certification tests, regardless of whether an FAA pilot is at the controls. Initial pilot familiarization may be considered official test time even though no specific tests are conducted.

(2) Certification flight time does not include ferrying to remote areas, or tests conducted for purposes other than determination of compliance, regardless of whether an FAA pilot is at the controls. ☆

"approved" until such FAA inspections have been satisfactorily completed. A TIA will also be issued when flight tests are to be conducted by a Flight Test Pilot Representative. The DER who approves the data should work out the flight test program with the Pilot and Flight Analyst Representatives and the complete file should be submitted with FAA Form 8110.3.

c. A DER may also be authorized to conduct compliance inspections.

203. TRAINING AND SUPERVISION.

* a. The appropriate branch chief in the FAA regional office is responsible for indoctrination of each designee appointed by that office. In this connection and keeping in mind the basic required qualifications for designee appointment (particularly paragraph 195.a(2)), the designee will be familiarized with all necessary administrative procedures, practices, and official records and will be provided with all pertinent forms and instructions. The designee will be contacted as necessary to assure that he is currently and adequately informed with respect to changes in policies, procedures, practices, regulations, and associated standards, and that he is accomplishing his designee activities in an acceptable manner. *

b. In general, the designee will be guided by the same requirements, instructions, and procedures applicable to FAA employees in the performance of similar duties.

* c. DER submittals are to be retained in FAA files until disposal is called for in accordance with applicable guidelines. DER submittals may be reviewed or postreviewed by FAA. When the data have been accepted, the responsible project engineer will initial and date the FAA form 8110.3, and indicate which, if any, data have been reviewed. The proportion of each DER's approved data to be reviewed by FAA and the depth of that review should be proportional to the experience of FAA with the individual DER. During the first year of a DER's appointment, approximately one third to one half of the DER's submittals should be reviewed or postreviewed sufficiently to assure compliance with applicable regulations. After one year of satisfactory experience with no major airworthiness deficiencies noted, the review level may be reduced; but approximately 5 percent of every DER's submittals should be reviewed or postreviewed by FAA.

d. In every case, when a major airworthiness deficiency is noted (one which would seriously affect the airworthiness of the product), the previous submittals by the DER should be postreviewed 100 percent going back chronologically far enough to reasonably assure that the DER's previous submittals were satisfactory. In addition, submittals by that DER in the future should be reviewed at least at the 50 percent level until there is reasonable assurance that the DER performance is satisfactory. *

204. DURATION AND RENEWAL OF DESIGNATIONS.

a. Engineering representative designations expire 12 calendar months

after the last day of the month during which they are issued or last renewed. They may be renewed at any time within 90 days prior to the expiration date provided that concurrence of all concerned is evident. Although the expiration of designation differs from a termination (in that the latter is usually for cause), a designation which has expired is not renewable without review. In such instances, the original designation number may be reassigned to the same individual, but reissuance of the expired designation will be handled in the same manner as the original appointment.

* b. A new FAA Form 8430-9 must be issued each time a designation is renewed in order to specify the new expiration date. The original number will be retained. *

c. The designation number to be used is the regional office prefix followed by a dash and the consecutive number of designees in that region.

* d. The FAA Form 8000-5 need not be reissued; however, upon expiration or cancellation of a designation, the FAA Form 8000-5 should be returned to the FAA. If a designee wishes to retain the FAA Form 8000-5, then he may do so * provided it is first returned to the FAA and is marked CANCELED or EXPIRED.

e. Since a designee is identified by number to the FAA authorizing office, a geographical transfer of a designee and/or his employer from one FAA *region to another necessitates the return by the designee of the FAA Form 8430-9, Certificate of Authority, and FAA Form 8000-5, Certificate of Designation, to the original authorizing region. That region will then notify the new region in which the employer and designee will be located. The new region will then reissue the FAA Forms 8430-9 and 8000-5 under a new number in accordance with * its regional numerical sequence. There is no geographical limitation on the area in which a designee may work.

205. GUIDANCE MATERIAL KITS.

* a. A Guidance Material Kit for each designee can be obtained following his selection and appointment by submitting his name and mailing address to the Program Management Staff, AFS-103. When a new DER is appointed, an existing DER has a change of address, or a designation expires/is canceled, the Engineering and Manufacturing Branch/Aircraft Engineering Division should submit required information on two copies of FAA Form 1770-7.

(1) If the DER is self-employed, "DR-2" should be on line 1; his name (two initials and last name only) and designation number should be on line 2; and his address should be on lines 4 and 5.

(2) If the DER is employed by a manufacturer, "DR-2" should be on line 1; the employer's name should be on line 2; his name (two initials and last name only) and designation number should be on line 3; and the employer's address should be on lines 4 and 5.

b. FAA Form 1770-7, DMIR/DER Mailing List Action Request, is stocked in *

*the FAA depot and may be obtained by referring to NSN:0052-00-851-8000, unit of issue: sheet.

c. The following publications will be included in each Guidance Material Kit shipped from the DOT warehouse:

(1) Federal Aviation Regulations Parts 1 thru 49, 91, 121, 133, and 183.

(2) Advisory Circulars, Aircraft, Subject No. 20.

(3) Summary of Supplemental Type Certificate Supplements.

(4) Order series 8110 and 8150 (except 8110.6).

d. The appropriate branch chief in the FAA regional office is responsible for assuring that a Guidance Material Kit is provided to each designee appointed. All necessary forms, instructions, and other material not in the Kit described above are still to be provided by that office as outlined in paragraph 203a. A designee's request for additional material or material that was not included in the original Kit submitted should be sent to the designating FAA regional office. *

206. -208. RESERVED.

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Mr. BUTTERWORTH. Getting back, for the last time, to the fail-passive autoland system, what studies did the FAA conduct to determine that the visual cues at 700 RVR would be sufficient for the pilot to execute the maneuvers required while using that system?

Mr. FERRARESE. Well, Mr. Butterworth, as you probably know, the whole issue of low visibility is an evolutionary one. To put this thing in perspective, I would like to give a brief, historical background.

Mr. BUTTERWORTH. Very well.

Mr. FERRARESE. The basic ILS weather minimum of 200 feet and one-half mile visibility was established in 1946. In 1958, when the turbojets came on the scene, the FAA predecessor agency, the CAA, raised those minimums to 300 feet and three-quarters of a mile because the industry had very little experience with these airplanes. We wanted to be cautious in our approach to low weather minimums.

After 3 years of operation at those minimums, we developed criteria, in 1961, to apply to turbojet aircraft so that they could be authorized, or pilots could be authorized to operate them, to 200 feet and one-half mile visibility. We did this only after full coordination with the industry and the pilots' union. In addition, we required better ground facilities, better airborne equipment, and better pilot training as well as maintenance.

We did the same thing with category II about 3 or 4 years later, again requiring better equipment on the ground and in the air. A lot of testing was done, both in the United States and in Europe. There was the British Blind Landing Experimental Unit, you will recall. There was the PIFAX organization of the Air Force down at San Antonio which conducted many, many tests in actual conditions. We used the facilities at Berkeley, Calif., and the fog chamber.

During the ICAO discussions on all-weather, it was determined by someone—and I am certainly not the one—that a pilot needs 3 seconds of visual cues to take corrective action. At 140 knots, 3 seconds of visual cues translates into 700 feet.

Mr. BUTTERWORTH. So, that is how you arrived at 700 feet?

Mr. FERRARESE. That is how 700 feet became the absolute minimum for category IIIA.

Mr. BUTTERWORTH. You did not just take the 1,200, divide by two and add 100?

Mr. FERRARESE. No, sir. I have been accused of that many times, but that is not true at all. [Laughter.]

I would also like to point out that the French have been operating a fail passive automatic landing system since 1968 in Caravelle airplanes down to a minimum of 500 RVR, that is 300 RVR less than any category IIIA minimum we will authorize in the United States.

Mr. BUTTERWORTH. As you know, there is conflict in opinion as to how applicable the French experience is.

I was really leading up to a question.

Apparently, there was one study done in conjunction with the Air Force at Wright-Patterson AFB.

Mr. FERRARESE. Yes.

Mr. BUTTERWORTH. It is interesting. This report is dated December 6. I will read from the abstract. I believe this is an interim report. I do not know what actually happened to the final, and there may not be a final report.

At the end, it says, "It is concluded that efforts in the equipment development area, that is, heads-up display, and fail-passive autopilots, should be directed toward improving the safety and reliability of the 'clear-cut' see-to-land operations rather than being used as 'credits' for attaining a category III(a) capability."

As I understand it, this is precisely what the FAA has done through notice 8400.18.

It appears to have been a fairly extensive piece of work, with a lot of simulator and actual flight experience, though granted, it is an interim report.

I would like to submit it for the record, Mr. Chairman.

Mr. BURTON. Without objection, it will be kept for the record.

[The report entitled "Pilot Factors Considerations in See-To-Land," dated May 1976, is in the subcommittee files.]

Mr. BUTTERWORTH. I was wondering what happened to the program and the final report.

Mr. FERRARESE. I am not familiar with the entire program because I was not involved in it. The R. & D. folks were.

I would like to point out, though, that one of the Air Force officers involved in the study called to our attention, and also to the attention of the Air Force people at Wright-Patterson, that this simulator was very unrealistic. I have all the reasons why, if you would like them for the record.

Mr. BUTTERWORTH. Yes. Could we insert those in the record along with the two letters from ATA requesting that the study be canceled?

Mr. FERRARESE. Well, I do not know anything about that. I did see that in Mr. O'Donnell's statement. I am not aware of those letters.

Mr. BURTON. Without objection, they will be made a part of the record at this point.

[The material follows:]

Air Transport Association of AMERICA

1709 New York Avenue, N.W.
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Phone (202) 872-4000

August 20, 1974

General Spencer S. Hunn, Director
Systems Research & Development, ARD-1
Federal Aviation Administration
2100 2nd Street, S.W.
Washington, D.C. 20590

Dear General Hunn:

We appreciated the opportunity to discuss the FAA proposed "all weather" E & D program with you and your staff a week ago last Friday. As a major user of improved "all weather" capability we believe it is particularly important that the views of the airlines are considered to assure a program which will have a direct relationship to the achievement of safety and efficiency increases in operations.

Thus, we are pleased that our views, as expressed in our August 8, 1974 letter on the R & D work needed in the all weather program area, and your views appear to be in consonance on the significant contractual efforts which need to be a part of the program. It is our understanding that the following was agreed:

1. The use of the USAF C-141 and FAA CV 880 aircraft in the data collection task is intended only as a "platform in space" to carry experimental systems, and that data from these flights will not be used to assess the overall civil all weather system except where it is shown to be typical of current airline operations.

2. Data collection using the FAA Boeing 727, operated by Flight Standards Service in actual Category III weather, will receive primary emphasis in the program.

3. An effort will be made by FAA using other aircraft typical of those in airline service with automatic landing systems to obtain data on overall systems performance in actual Category III weather.

4. During airline line operations of Category III capable aircraft in actual Category II & III weather, the FAA program will collect operational data on the overall systems performance (ground and airborne). The data may involve use of pilot questionnaires;

however, in exceptional cases the airlines will consider providing the flight data recorder data in order to provide additional information.

5. The Head-Up Display effort may use flight tests if and when it has been shown that flight tests are necessary or of potential scientific value - after a thorough analysis of the operational role, the disadvantages, the human physiological/psychological factors (and the existing body of knowledge) of such displays. (We would like to be consulted before flight tests are programmed.)

6. The Independent Landing Monitor effort will emphasize an analysis leading to understanding of the potential operational role (and risks) of such systems, and will thoroughly examine the feasibility of providing the necessary level of integrity to assure such systems will not interfere with the automatic flight control system.

7. Task IV, the study of available ground roll performance measurement techniques, such as coded runway lights and DME, does not need to be and will not be a major portion of the all weather effort.

8. An inertially-augmented approach coupler study, if included after determination that such work will provide new needed knowledge, should not imply that such a system might be a prerequisite for airline operations below 1200 feet RVR 100 feet DH using Category II ground facilities.

9. The fail-passive system automatic landing system task is not a part of the FAA R & D program, except as it may become necessary to assist Flight Standards Service flight operations.

Although agreement was not reached on moving a Category III ILS from NAFEC to an operational airport, we continue to believe that significant worthwhile operational experience could be gained if this were to be done. Accordingly, we continue to urge that you reexamine your requirement for two Category III ILS systems at NAFEC (particularly for the version which will be typical of only two operational facilities) in the expectation that you may arrive at the view that it will be to your advantage to move the facility to assist the collection of data on airline operations in actual Category III weather. If necessary, we suggest a temporary replacement be obtained from the production contract for Category II facilities, upgraded to Category III, (for the period necessary to accomplish an "in service change" to move the Runway 31 ILS to Runway 13 at NAFEC). Further, the Category III ILS presently on Runway 13 could be installed at a moderate density operational location, if necessary, in order to permit occasional tests of equipment improvements.

As agreed, we will expect to be informed when the redrafted preliminary work statement, expressing our joint views, is available.

Thank you again for your help in achieving an economical and meaningful all weather R & D program to address the most apparent remaining problem areas in all weather operations.

Sincerely,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

Air Transport Association OF AMERICA

1709 New York Avenue, N.W.
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November 4, 1975

Mr. Robert W. Wedan
Deputy Director, Systems Research
and Development Service AFD-2
Federal Aviation Administration
2100 Second Street, S.W.
Washington, D.C. 20590

Dear Bob:

This letter contains a number of comments submitted on behalf of the airlines Flight Systems Integration Committee, regarding FAA's R, E&D activities on all-weather and the related windshear activities. The Committee would also like to express their appreciation for the briefing provided by your staff on October 7, 1975. It was descriptive, and served to help us understand your efforts.

We very much appreciate, and desire to support in any way we can an energetic FAA program on windshear, which would encompass the establishment of a better data base on windshear incidence; windshear prediction efforts; verification that windshear predictions match actual encounters with reasonable correlation; assessment of windshear detection possibilities; work on the problems of ground-to-air communication of windshear data and observations/predictions; simulation and flight trials of optimum flight procedures in windshear; assessment of the best use of ground and airborne cues derivable from existing (such as DME) and possible new instrumentation to help pilots best cope with windshear of various kinds; and finally, but most importantly, an increased emphasis by FAA towards near-term output to help pilots cope with severe windshears by optimum use of current information available on the ground and in aircraft. We understand a part of this work may be done under SRI contract. While this work is important, we believe it should not displace all work in the all-weather area, and we believe a certain amount of all-weather activity in FAA should continue.

As you know, we have had serious difficulties with the work statement for FAA's all-weather effort which led to the present SRI contract because we felt that it did not properly attack the problems airlines believe need to be worked on in the all-weather area. We recognize that significant adjustments have been made in the work to be conducted under this program as briefed to the Committee on October 7, 1975, by your staff. The Committee felt, however, that we should go ahead and describe our views to you at this time pending receipt of a firm statement of the work to be conducted.

In the all-weather area we believe the following efforts deserve FAA work, either under the SRI contract or in other programs:

Category IIIa and IIIb Operational Experience

The longer term Category III effort should concentrate on obtaining operational experience in actual and simulated Category IIIa and IIIb weather, but with data of scientific quality gathered by E&D. Aircraft should be typical of airline aircraft in current service. The emphasis should be on evaluating the visual runway and taxi information available to the pilot, and the overall Category III environment.

Category III Weather Investigation

This program should include 1) an effort to measure the actual dynamic behavior of weather near and on the runway during real-life Category III conditions; and 2) an accelerated effort to assess available improved RVR transmissometers with the capability to measure much lower visibility values (down to 100 feet), to measure them more often, and to read out in finer increments (100 feet).

Category III Performance Assurance

A part of the longer term effort should be the development of improved performance assurance techniques for Category III ground facilities, both at the equipment and the signal-on-the-runway level. General performance assurance efforts on ILS are not included in this program.

"Seeing-Through-Fog" Devices/"ILM" Investigation

The longer term program should include analysis on "seeing-through-fog" devices, such as devices which are truly independent of other guidance and instrumentation in the aircraft, for use in assessment of ILS automatic landing system performance. The analysis should include development of a realistic statement of operational needs, if any, for "independent landing monitors" (ILM), and determination of the technical feasibility of providing integrity and reliability comparable to the integrity and reliability of the basic system landing the aircraft.

Category III Lighting

The comparability of runway balanced centerline and edge lights as a basis for RVR measurement should be operationally evaluated in order to support the U. S. Position to international standardization on this matter.

Airline Operations Data Analysis and Investigation of Use of Fail-Passive and Fail-Operational Autoland Systems

The longer term Category III effort should include data gathering on the performance of operational airline Category IIIa airborne equipment in airline operations with appropriate ground facilities. After coordination with concerned airlines, the test results should be made available to other interested groups. (The coordination is intended only to establish that the reports are factually complete, and the conclusions and recommendations are substantiated.)

We also suggest that so called "illusions" be evaluated in conjunction with windshear, taking into account various lighting and marking conditions for all-weather conditions (Category I and better included).

In commenting on the SRI drafts, we are aware that you are bound by contractual obligations since a decision was made to let the contract with the earlier work statement; yet our comments naturally have to look at the work statements on their merits as we see them.

Several of the statements are improved significantly over the work statements we saw earlier, but problems remain. Having now looked very briefly at the draft work statements, the following are summary comments:

Task 1, All Weather Operations Survey (Draft dated September 4, 1975)

This work statement correlates to some degree with our stated needs for all weather work. However, there is probably less R&D in this task as stated than operations analysis, and therefore this effort should not command a great deal of money but should draw where possible on available data.

A simple review of the current status should serve to highlight the significant differences which we understand exist, and which we think will show that data from government aircraft can't serve as a basis for analysis of civil all weather operations.

With respect to automatic RVR recording, we have recommended to FAA that a number of such systems be installed for operational use at Category II and III runways. The R&D involved should be relatively modest, other than to buy the devices, install them, and use the data.

Task 2, All Weather System Cockpit Simulation Studies (Draft dated September 8, 1975)

This draft appears to be very general and has not defined a problem to be solved. The work statement as it reads now has windshear work woven into it and this may become useful when the windshear program is defined. With the exception of the emphasis of windshear, we think there are too many generalities looking for a problem in this draft. The

problems to be solved should be defined, preferably in terms of accidents and incidents.

If this is the part of the work in which the HUD roles are to be defined, it is not made clear. It seems to us we should not spend money looking for problems when there are problems which have been clearly defined. We have no problems with simulator studies, when specific problems are identified. We gather from the presentation on October 7, 1975, that this task is being substantially revised.

Task 3, Independent Landing Monitors (Draft dated September 19, 1975)

This appears to us to be a good example of a solution looking for an application. As we recommended in our letter to FAA recommending human factors research, we have no objection to analysis being conducted to establish potential roles for an ILM and HUD in response to identified problems, but we also identified certain basic questions which have to be considered, in particular those related to integrity and physiological and psychological factors. This work statement deals far more with procurement and installation of prototype hardware than with anything else; and we believe prototype hardware should not have a place in this work statement.

A whole series of devices already exist, and especially the scanning radar has been around a long time. We believe this work statement should be limited to the proper definition and an analysis of potential roles and problems of ILM devices. We believe that to go further -- to specification of particular hardware, is not warranted at this time.

Task 4, Ground Roll Performance Measurement System (Draft dated September 4, 1975)

We have doubts about the value of this effort. There appears to be relatively little new in this work statement. It seems to make an assumption that there is a near-term requirement for Category IIIc operations, and it seems largely to plow old ground on which masses of information already exist. Further, the general wording used can be misinterpreted to apply to take off as well as landing; this would be improper and the wording should be changed to preclude this misinterpretation.

We tend to believe that determination of landing roll distance can be dealt with easily in a brief in-house assessment in FAA without having to use contractor funds.

Due to the recent consideration of L-band DME as an element of the MLS system, it would appear relevant to investigate the potential for using the same L-band DME with ILS (for the same purposes) during the period of transition from ILS to MLS.

Task 5, Inertial Augmentation (Draft dated August 15, 1975)

Here again there is a great deal of data available. Inertial augmentation has been worked on by airframe manufacturers, by FAA, and by NASA. The value of inertial data in smoothing erratic sensor sources is well known and well understood, and we see little new that might be derived from the work as stated. There appears to be an assumption that we might count on INS equipment to be available in most airline aircraft, and this is wrong. We think a basic question arises out of this task which does seem to us to be worth trying to answer:

> Since acceleration and velocity data is useful in coping with certain autoland operations and in certain windshear conditions, what is the least sophisticated source for such information which is available, or could be made available, in airline cockpits; and how can this source be best integrated into the information available to pilots?
>
> A related question is whether the requirement for augmentation is greater or less (and how much) when MLS signal quality is available instead of ILS.

In all of this work a great deal of history exists, and much past work has been done. Analysis of that work should be exhausted before new flying is undertaken.

Task 6, Low Weather Minima Landing System for Small Aircraft (Draft dated September 4, 1975)

This task does not represent an airline need, and we would prefer not to comment on it specifically.

In considering useful work which might be done under the SRI contract, we hope you will also favorably consider the work recommended in our letter to Mr. David Sheftel, dated August 11, 1975 (copy attached).

Yours truly,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

Attachment

Air Transport Association ata OF AMERICA

1709 New York Avenue, N.W.
Washington, D. C. 20006
Phone (202) 872-4000

August 11, 1975

Mr. David J. Sheftel, Director
Systems Research and Development Service, ARD-1
Federal Aviation Administration
2100 Second Street, S.W.
Washington, D.C. 20590

Dear Dave:

As you know, the airlines have long maintained a group of flight and engineering experts in the field of all weather operations and systems (formerly the airlines' All Weather Operations Committee, now the Flight Systems Integration Committee). Because airlines and their passengers are the basic civil beneficiaries of safe, reliable poor visibility operations, airlines have worked in close cooperation with FAA on each of the steps taken by FAA and airlines to achieve safe and efficient operations at lower landing minimums -- Category I, II, and IIIa.

At its meeting on July 15 and 16, 1975 our Committee asked that we write to express our surprise and concern that, without coordination, the Systems Research and Development Service has entered into formal program(s) with the military to conduct all weather simulation and flight testing. We understand that in recent months SRDS has proposed recommendations for changes in the civil Category II system based upon this military testing; yet this appears to contravene understandings reached between our Committee and SRDS on the limited applicability of tests on military flight test vehicles to civil aircraft (see attachment). We have now been led to believe that this program has entered its third phase, and have been informed that specific decisions have been made to exclude past coordination with the airlines.

Because we continue to believe in the importance of cooperative effort in civil all weather programs, our Committee is concerned with the management and especially all flight and technical aspects of all FAA programs with possible impact on civil all weather operations. Because this work is intended to support civil, mostly airline operations, we have no choice but to recommend that FAA hold up all weather operations and systems work under agreements with the military services, until the promised coordination with us has been accomplished and agreement hopefully reached on the statement of work.

Our Committee also reviewed the recently revised All-Weather Engineering Support [illegible] changes on which there had been agreement had been incorporated in the work

statement. (Our earlier detailed comments are reproduced in Attachment B.) Our Committee had found little relation in that work statement to real needs of the all-weather operations efforts, and little reason to justify expenditure of FAA funds. Our Committee therefore recommends that work under the contract be stopped and the contract terminated, or that it be converted to useful work upon which agreement can be reached with those who are to benefit.

We would appreciate your timely response.

Sincerely,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

Attachments

LOW VISIBILITY LANDING SIMULATION (LOVISM)

In 1975, the FAA conducted a joint program with the USAF to investigate the effects of reduced vision cues due to low visibility conditions on pilot performance during landings. The program was conducted by the U.S. Air Force Flight Dynamics Laboratory at Wright-Patterson AFB in Dayton, Ohio, in a visual and motion simulator of a KC-135 aircraft.

Although the program objectives were generally well defined, formidable problems were encountered in the program's experimental design, and there were unresolvable technical problems discovered in the simulation itself, both of which eventually led to the program's cancellation. For example, the simulator was found to have flight characteristics which resulted in large oscillations in the vertical flightpath near the ground. These motions were so large and unlike any motions that are encountered in an actual aircraft, that they masked any measurable effects of bad visibility on pilot performance. Another area where technical problems were found was in the aerodynamic model of the simulator when the aircraft was approaching the ground for a landing. The so-called "ground effect" parameters, which are an important part of a simulator realistically modelling a landing maneuver, were found to be in error by a factor of five times the correct value.

Given the problems discovered with the simulation and the fundamental vision system and control system limitations, it did not appear practical or even possible to continue the program or to try to fix the simulation since the effects we were trying to measure were smaller than the random variations in the simulators performance.

To illustrate the degree of these inaccuracies, it was found that even in clear weather when real aircraft land at about 2 fps vertical speed, the simulator typically landed at 9 feet per second vertical speed, which for a real aircraft, is a value so large that it would nearly be a crash.

From an experimental design point of view, the tests were conducted with many factors different than "real-world" operations. These factors virtually rendered useless any data that was taken up to the time of the program's cancellation. Some of the major problems in this area were:

1. The approaches were flown manually to decision height; in real operations, manual approaches are not representative of actual CAT II or CAT III low visibility approaches.

2. No crew coordination or crew callouts were used.

3. The pilots were told not to look at cockpit instruments once decision height was passed.

4. Pilots were artificially subjected to lateral and vertical position offsets at low altitudes which were larger than the values they would normally be expected to execute a go-around from even at much higher altitudes.

As a result of the technical difficulties, the experimental design problems, and the remote chances of upgrading the simulation with time, budget, or state-of-the-art limitations, the FAA found that valid results were not possible and concluded that the program should be terminated.

Mr. FERRARESE. That study was not canceled, incidentally, because of ATA. It was canceled because the simulator, in our judgment, was not realistic. It did not represent a modern-day transport. The visual system was inadequate. The longitudinal pitch occilations were bad, and so on.

Mr. BUTTERWORTH. Thank you.

Mr. BURTON. We have one more question, or a couple of questions from Ms. Halterman, and then we will break for lunch and reconvene at 1:30 for "Cockroach Corner" and just a few questions to bring us up to date on the continuing MLS drama.

Mr. BOND. Mr. Chairman, will we not touch on certification after lunch? If not, we will let some of these folks go.

Mr. BURTON. You can let them go, and if we have anything more for the record, we will submit it in writing.

I commend each of you on your willingness to give favorable consideration to opening up the advisory circular and internal order process.

Ms. Halterman?

Ms. HALTERMAN. Thank you, Mr. Chairman.

Mr. Ferrarese, I would like to follow up on Mr. Butterworth's questioning on the fail-passive autoland system.

I think it would be useful for the record if you discussed the comparisons between the French experience and ours.

Mr. FERRARESE. Certainly. We intend to.

Mr. BURTON. I think she would like you to do that now, if you would.

Mr. FERRARESE. Now?

Ms. HALTERMAN. Briefly, and then, perhaps, you could submit a fuller discussion for the record.

Mr. FERRARESE. Well, first, let me define what a fail-passive autolanding system is.

A fail-passive autolanding system is one that is internally monitored. Any significant fault in the system will manifest itself in the form of a warning to the pilot, in some form. In the case of our equipment in the Boeing 727, it automatically disconnects the autoland system and keeps the airplane in trim, so that the pilot now has control of the airplane and flies it manually. This only occurs when you have a significant fault.

In the case of the Caravelle airplane, it too has a fail-passive autoland system, but it is not fail passive in every failure mode. There are some failure modes that I understand do not manifest themselves to the pilot until the actual fault itself manifests itself. For example, a pitch-up at, say, about 100 feet will not give a pilot a warning on his instrument panel.

In addition, for failure modes that do give a warning to the pilot, the pilot still has to take manual action to disconnect the autocoupler.

In our view, based on what we know of the system, which is a very old one, it would not meet our requirements.

Ms. HALTERMAN. Thank you.

[The information referred to follows:]

AUTOMATIC LANDING SYSTEMS

French Experience

From an airworthiness point of view, the single-channel Lear autopilot used by the French on the Caravelle for CAT IIIb operations probably would not even meet our stringent criteria used for the B727 for CAT IIIa (700 RVR), let alone CAT IIIb (500 RVR) as the French use it. Nevertheless it is significant that the French domestic airline at that time had conducted about 14,000 automatic landings primarily with this aircraft, of which approximately 1,400 were in CAT III weather as low as 500 RVR without accident or incident. This was done, it should be noted, with a system which probably would not have met the FAA criteria for the B727, and without a head-up display (which ALPA has cited as necessary for such operations).

The use of autothrottles in the case of the B727 is an operations issue, not an airworthiness issue. In CAT II operations to a 100-foot DH, autothrottles are not required when making an autoland or when making a coupled approach disconnecting at decision height, and making a manual landing. The FAA does not believe there is any increase in workload and, in fact, it is more likely that there is a decrease in workload when operating in CAT IIIa with a 50-foot DH because in the CAT IIIa situation, the landing is automatic. Accordingly, it was not felt that mandatory use of autothrottles was justified.

Crew qualifications, procedures, and training for CAT IIIa are carefully established and closely monitored by FAA for all CAT III operations. There are no fundamental differences in this area between use of fail-operational or fail-passive systems. ALPA crews with three airlines have agreed with and, for some time now, been routinely flying U.S. CAT IIIa operations without problems related to these areas.

As for the 3-man crew requirement cited by ALPA, the B727 is already operated with a 3-man crew. Further, the crew complement is determined in the basic airworthiness certification process. The implication that operation of an aircraft in CAT IIIa weather conditions requires additional crewmembers beyond the complement specified at the time the aircraft is certified has no basis in fact.

As far as ALPA's claim that the "French procedures should be mandatory" if safety is to be assured, we will, as always, when an operational approval is considered for a fail-passive system, ensure that the procedures proposed for the operation will be safe.

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Mr. BURTON. The hearing will now be in recess until 1:30 p.m.
[Mr. Bond's prepared statement follows:]

PREPARED STATEMENT OF LANGHORNE BOND, ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION

OPERATION OF LARGE AIRCRAFT

Mr. Chairman and Members of the Subcommittee:

The FAA shares the Subcommittee's concern for the safety implications of large aircraft operations where any attempt is made to circumvent the stringent requirements of FAR Part 121 by resorting to a leasing ruse. While the focus of the problem has recently been the Miami/South Florida area, the issue should by no means be thought of as limited to that part of the country. I have asked Phil Swatek, the Director of our Southern Region, to describe to you in some detail the situation he has encountered in the Miami area and the steps he has taken to deal with the problem under our present laws and regulations. For my part, I would like to give you my views of the situation in today's rapidly changing climate of deregulation and to tell you about some of the initiatives underway, both within FAA and elsewhere.

First, I must stress that, while undeniably a problem has existed, the FAA has not stood idly by and let it fester. Following the well known Admiral Smith report in February 1971, the FAA moved decisively to implement the task force's

recommendations. The bulk of these recommendations have been implemented.

Certainly the most significant of Admiral Smith's proposals were the regulatory changes now embodied in Subpart D of Part 91 of the Federal Aviation Regulations. Both the task force and the FAA recognized at the time that these regulations might not be the cure-all to the illegal charter problem but that an evaluation period was necessary to determine whether an acceptable level of safety was, in fact, being realized with the new regulations. The FAA's monitoring of the impact of Subpart D has led to the conclusion that, while many operators, mostly in the business and corporate community, have achieved an enviable safety record under this regime, those engaged in the grey area between common and private carriage by air have not.

We are today at an important crossroads in the air transportation industry. Public Law 95-163 has provided for deregulated entry into domestic air cargo service. At the same time, older jet aircraft have been disposed of by the scheduled carriers, becoming obvious vehicles for a burgeoning and profitable cargo business. Finally, the economic implications of these developments to areas of the

country such as Miami, and to a favorable balance of payments, are inescapable. It is, therefore, imperative that we as a safety agency be able to assure a safe environment in which this industry can operate, while at the same time not stifle its new found economic freedom.

Under Section 604 of the Act, the FAA has a responsibility concurrent with that exercised by the CAB to certificate air carriers. In discharging this responsibility, the Agency must make a threshold decision as to whether an operation is in common or private carriage. Obviously if a person is certificated by the CAB as an air carrier under Section 401 of the Act, the Agency's judgment is limited to safety considerations. But in the case of an operator holding no economic authority, the FAA must make both the economic and the resulting safety judgment.

As a result, the FAA has been drawn into the area of economic regulation of commercial operators without adequate economic certification requirements, without a clear legal delineation of the roles of such operators, and without a clear definition of common carriage as contrasted to private carriage. The many and devious schemes used by lessors of large airplanes often enable them to escape accountability

for the operation of the aircraft. The investigative task, necessary under present regulations of obtaining factual data to determine whether the lessor is, in fact, the legal operator, and whether the operation meets the legal test for "compensation or hire," is time consuming, frustrating and frequently unproductive. Moreover, our inspectors are not well suited to this task since their training and experience is largely in the technical aspects of aircraft operation and maintenance. These investigations involve hundreds and frequently thousands of employee hours and often result in an unprovable case or a declined prosecution.

As you know, the FAA is not a law enforcement agency endowed with police powers. Our inspectors have no authority to arrest or detain. Our processes and remedies are entirely civil. Even our seizure authority is really no more than the summary foreclosure of a statutory lien for civil penalties, and provides for the immediate release of the offending aircraft upon posting of a bond. While we work closely with the Department of Justice, it is still necessary to refer these cases to United States Attorneys for filing of civil actions in an already crowded docket. As an example, the FAA in February of 1974 seized a Lockheed Electra for egregious and wilful violations of the regulations. Although the

aircraft was quickly released upon posting of bond, the case took more than two years to bring to trial. Now, nearly five years since the seizure, the matter is still on appeal and the issues unresolved.

Mr. Chairman, that is where we have come from, and where we are today. Let me now turn to where we are going and the many initiatives already underway.

First, it is apparent that FAA inspectors must be relieved of the need to conduct "economic" investigations aimed at piercing sham leases and determining whether an operation is for compensation or hire. Likewise, the operators themselves should not be burdened with confusing and often nebulous legal requirements for deciding whether their own operations are lawful. A clear and unequivocal set of safety standards is necessary for both parties. I believe that Part 121 fixes adequate standards for operators certificated by the CAB as air carriers and required to meet the highest possible degree of safety as provided in section 601(b) of the Federal Aviation Act. However, I do not believe that Subpart D, as presently constituted, provides a sufficient level of safety for other large aircraft operations, especially those with which the Subcommittee is concerned at this hearing.

I have, therefore, established a high priority regulatory project to revise Part 91 of the Federal Aviation Regulations to accomplish these as well as other much needed changes. Actually, this project has two important goals. The first is to simplify and reorganize existing Part 91 so it will be more easily understood by all classes of General Aviation Operators. The second, of primary interest to this Committee, is the upgrade of Subpart D.

While it is premature to spell out in detail what the FAA will propose, I can assure you that at the very minimum the maintenance and inspection standards along with pilot qualification and proficiency standards will be similar to those presently required in Part 121. Whether it is necessary or desirable to go further is still under study, but I am sure the Subcommittee will be interested to know that we are considering including in the new rule specific provisions for access by our inspectors to these aircraft such as presently are contained in Sections 121.81 and 121.548 of our air carrier regulations. We are cognizant though that legal impediments may exist in this area in light of the Supreme Court's recent decision in Marshall v. Barlow's Inc., and the language of our own statute.

Our second major initiative is a legislative proposal now in the final processes of coordination. The CAB and the Administrative Conference of the United States have made additional suggestions which we will review with them before the beginning of the 96th Congress. This proposal, if enacted by the Congress, will fill two important needs. First, the civil penalty limit under section 901 of the Act would be raised from $1,000 to $25,000. The present limit of $1,000 per violation has remained unchanged from its original enactment in the 1938 Act. Under the present law, in many cases, penalties imposed by the courts have not been a deterrent but merely an incidental cost of doing business. Even more important, the proposed bill would amend section 902 of the Act to apply criminal sanctions for wilful and knowing violations of the safety provisions of Title VI of the Act. Finally, criminal sanctions would attach to the wilful failure to file, or falsification of, required records or reports. Experience has shown time and again that the only effective deterrent against flagrant and intentional safety violations is criminal prosecution. Indeed the 9th Circuit Court of Appeals recently expressed judicial amazement for the proposition that serious acts of misconduct in an automobile could carry stiff prison sentences where the same acts in an airplane carried only civil sanctions. These provisions, if enacted into law, would materially enhance the

FAA's ability to stop operations such as have taken place in Miami and elsewhere.

The Subcommittee is no doubt aware of a difficult problem which occasionally arises when a U.S. large aircraft operation uses the authority of a Foreign Air Carrier Permit, usually referred to as a 402 Permit, to conduct air carrier operations to and from this country at a lower level of safety that he would be subject to were he certificated under Part 121. Criticisms have been made from time to time that this practice results in a form of aeronautical "flag of convenience" and to a degree these criticisms are valid. The Civil Aeronautics Board issues a 402 permit to foreign air carriers after making a finding that the carrier is "fit, willing and able" -- the same finding the Board must make to issue a certificate under Section 401 of the Act.

The FAA issues no certificate or license to these 402 certificate holders. Instead, under Part 129 of the regulations, operations specifications are issued. Due to treaty constraints, these specifications are limited essentially to air traffic and navigational requirements and do not extend to airworthiness or airman qualifications. Ordinarily this presents no problems since these are the areas addressed by the treaties. However, where the permit

holder is using U.S. crews and U.S. registered aircraft an anomaly exists. Instead of having to meet the highest possible degree of safety required for air carriers as implemented in Part 121, the operator must only meet the less stringent Subpart D requirements. While this is not a commonplace situation, it is obviously undesirable. We are presently working on a joint solution to the problem with the CAB, involving additional limitations by that agency in its 402 proceedings and companion requirements in Part 129 operations specifications. Obviously, this is an area of some sensitivity since any action taken by either agency may affect the operating rights of foreign airplanes to this country and our own flag carriers abroad.

No discussion of this whole problem would be complete without mentioning the unprecedented actions by the CAB towards opening entry into the supplemental air transportation industry and the tremendous demand for "lift capacity." As I am sure the Subcommittee is aware, the Board in a proceeding entitled "Former Large Irregular Air Service Investigation" is considering the applications of 66 persons for authority to conduct supplemental air carrier operations. Many of these applicants have never previously held economic authority from the Board. Within this group are many persons presently engaged in large aircraft leasing operations

governed by Subpart D. Although it is obviously too early to tell how many of these applicants will receive operating authority, I think it is fair to predict that when this number is added to those seeking authority as domestic cargo operators pursuant to Public Law 93-163, we will have a record number of air carriers certificated by the FAA under Part 121. At the same time, as I announced recently, the FAA is about to issue final rules significantly improving the requirements under which the commuter airlines and air taxis operate. These rules will also extend to an increasing number of large aircraft operating under exemption authority from the Board.

Mr. Chairman, it is apparent that, as the policies of deregulation open entry into the air transportation industry, the level of safety of that industry will likewise be improved by bringing more operators within our comprehensive regulatory scheme for air carriers. At the same time, the incentives to engage in devious leasing practices to circumvent restrictive economic requirements will, I believe, disappear, and in place will emerge air carriers fully certificated by both CAB and FAA meeting an economic need and the highest level of safety required by the Act.

AIRCRAFT CERTIFICATION PROCEDURES

You have asked me to appear before you today to discuss "The FAA's process for certifying transport category aircraft and aircraft components . . . ." Your letter goes on to indicate that, while this Committee has historically had an interest in the FAA's certification process, the present hearing is occasioned by certain allegations raised by the Air Line Pilots Association (ALPA).

Mr. Chairman, it has become clear to me, having observed ALPA's intense lobbying campaign over the past few months, that ALPA's concern is not with the certification process per se; rather, ALPA has chosen to question the certification process as part of its concerted effort to ensure that the DC-9-80 and future U.S. aircraft are certificated with three crew members in the cockpit. This is a decision which is properly vested in the FAA and I have every confidence that it will be made with the highest regard for the safety of the travelling public.

ALPA's request to "open" the certification process has the appeal of a Lorelei and the substance of smoke. We are aware

of the allegations brought to your attention by ALPA. These allegations are not new. They have been raised before and addressed by the FAA. We stand ready to answer any questions you may have on these subjects.

However I am greatly concerned by the fact that ALPA has chosen to raise the issue of the "openness" of the certification process in its quest for a three man DC-9-80 crew. Make no mistake that the certification process as it currently exists is the foundation of the tremendous safety record achieved by U.S. aircraft manufacturers; and, it is also responsible in large part for the preeminence of the U.S. in the sale of aircraft throughout the world. The process' great esteem in the world community is abundantly demonstrated by the fact that it has been copied by several nations and, by the number of U.S. aircraft sold both here and abroad.

"Opening" the certification process by inserting ALPA will not enhance safety. The certification of U.S. manufactured aircraft depends upon the free flow of proprietary data between the FAA and the manufacturers. By inserting ALPA or any other third party, the protection afforded by law to the U.S. manufacturer's proprietary data will be lost. The impact this

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would have on safety would be immediate. The impact of the loss of the protection afforded this proprietary data by law on the sale of U.S. aircraft and, concomitantly on U.S. jobs plus the balance of payments would be devastating. Availability of U.S. manufacturers proprietary data to foreign competitors would soon lead to the foreign manufacturers matching and even surpassing the U.S. Our aircraft manufacturing industry is currently faced with the most serious foreign competition it has faced to date -- the Airbus. As responsible government officials we must recognize this foreign challenge in conjunction with the impact of further opening the U.S. aircraft certification process especially when safety will not be furthered by a more open process. As you will readily see from the rest of my testimony, any legitimate concern as to the soundness of the U.S. aircraft certification process can be remedied through the public rulemaking and need not be at the expense of safety, U.S. jobs and the U.S. balance of payments.

Having established a frame of reference, I would like to first generally outline the type certification process used by the FAA. Afterwards I will address more specifically the allegations referenced by the Subcommittee in its letter of invitation as to the potential for "opening" the aircraft certification process.

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It is important to recognize that the scope of the FAA's aircraft certification process is indeed broad and, to the extent feasible, open to the public. The certification process begins with FAA regulations established through a multitude of public rulemaking proceedings. These rulemakings can be initiated at the suggestion of the public or the agency and there are extensive opportunities for public participation regardless of how they are initiated. During the past three years, for example, we have held four major public hearings on the rules concerning aircraft certification; hearings that lasted from 3 to 8 working days. At one such hearing, which lasted for two weeks in December 1974, we considered over 1,000 proposed changes to our certification regulations. Nearly 700 attendees were present, including foreign certifying authorities, U.S. and foreign aircraft manufacturers and airlines, and airline pilots. Our records reflect more than 35 airline pilots were in attendance.

The FAA's research and development efforts play an important role in the aircraft certification process. Participation by interested parties has long been a characteristic of the FAA's research and development projects. For example, we currently have ongoing, as the result of a user's conference last March,

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a number of working groups comprised of members of the aviation community who are looking at a number of critical topic areas to provide their input to us in formulating the future composition of the air traffic control system.

The final aspect of the certification process is the vigorous procedures the FAA uses to ensure the aircraft meet the standards established through public rulemaking. Because of the proprietary nature of the data disclosed by the manufacturers in this phase of the process, participation by parties other than the FAA and the manufacturer is less extensive than in the other phases but still possible. An interested party is certainly free to make any submission it deems relevant to the certifying FAA officials.

Because of the general familiarity with FAA rulemaking and research and development efforts, I will highlight in this testimony the certification process from the time an application is submitted to FAA by a manufacturer. The illustration assumes a totally new aircraft but is adaptable to the hundreds of modification certifications carried on by the FAA.

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The filing of the type certificate application generally occurs at the aircraft's concept/design stage. This application triggers an elaborate and sophisticated process developed, refined and proven over a period of years by which the FAA analyzes and tests a proposed aircraft design to assure the aircraft's safety.

The filing of the application is ordinarily followed by a period of several months in which initial contacts are made with the applicant and matters of general concern, such as the type certification process and procedures, are discussed. Once these initial steps are completed, a Preliminary Type Certification Board meeting is convened. This Board is comprised of FAA engineering representatives, with different areas of specialization, who are presented the concept and engineering basis for the aircraft by the applicant. At this preliminary meeting, the FAA specifies the relevant Federal Aviation Regulations that will form the aircraft's certification basis.

Following this preliminary board meeting, an extensive evaluation process is initiated. During the evaluation process, the applicant proposes a regulatory compliance program -- flight tests, computer analysis, laboratory tests, and other

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sophisticated techniques -- by which the applicant will demonstrate to the FAA that the aircraft complies with applicable Federal Aviation Regulations. Following FAA approval of the general compliance approach, the applicant must propose a testing methodology for each of the aircraft's thousands of engineering design details. The FAA reviews each of the applicant's proposals and approves, requests modifications, or rejects the proposed methods of demonstrating compliance with the regulations.

After these detailed procedures are approved, the actual testing and analysis is conducted under the active surveillance of FAA. Upon completion of these test procedures and analyses, the applicant formally documents the results and submits them to the FAA for further review.

The evaluation activities take the largest portion of time consumed by the certification process since they involve literally thousands upon thousands of tests on parts, components and assemblies, and finally the actual aircraft. It frequently lasts as long as three or four years. For example, type certification of the 747 took over 3 1/2 years; the application was received in May 1966, and the type certificate issued in December 1969.

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During the evaluation process, one or more Interim Type Certification Boards are generally held to permit the applicant and the FAA to review progress and agree upon plans for subsequent portions of the evaluation process. These board meetings are a formal means of exchanging information, and are not convened for the purpose of decision-making. It is fundamental to an understanding of this phase of the certification process to know that the basic certification decisions do not take place at the Board meetings. These meetings are essential to the efficiency of the process but the Board does not make the final decision whether to grant a type certificate at this time.

As the evaluation process continues, the amounts of data accumulated become staggering and the intensity of the work efforts becomes correspondingly greater until the applicant concludes the aircraft is ready for formal flight testing. This usually occurs with less than a year remaining before anticipated aircraft certification. By this time the initial aircraft has been built, and the applicant has conducted its own initial flight testing.

When the applicant considers the aircraft ready for FAA flight testing, a Preflight Certification Board is held, and progress

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is again reviewed with the applicant. If the FAA finds the aircraft is ready for flight inspection and testing, a Type Inspection Authorization is issued, and a period of flight testing follows with applicant and FAA personnel both participating.

Flight testing of the aircraft by the FAA may take as long as six to nine months. For example, during the type certification process for the B-747, five aircraft were flown for a total of 1400 hours, of which 550 hours were logged by FAA personnel. During this flight test process, all evaluation results that were previously assessed are rechecked in light of actual aircraft performance, and the engineering design is thoroughly reviewed. If, at the completion of this phase, the FAA finds all applicable safety regulations are met, a type certificate is issued.

With this broad overview of the process in mind, I would like to illustrate for you more precisely the thoroughness of our procedures. To give you but one example, let us focus on the automatic flight control system of the 747, one of many systems on the 747. The initial autopilot system description was submitted to FAA in April 1968. Subsequently, the FAA was

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provided a systems failure analysis and laboratory test documents. These three documents, alone, comprised nearly 500 pages of detailed diagrams, computations, analyses, and test results. Approximately 400 FAA employee hours were spent reviewing this documentation and seven other documents that interface with the autopilot system. Later on, during the flight test phase, nearly 450 FAA employee hours were expended in preparation for ground testing, flight testing, and data review of the autopilot system. During this phase, the autopilot system was subjected by FAA pilots and engineers to over 200 flight conditions in 16 separate flights. The flight test summary report for the autopilot system contains over 100 pages. Approval of the autopilot system's compliance with the Federal Aviation Regulations was granted in December 1969, nearly two years after the initial submission of the system description.

As I mentioned earlier, the type certification of the aircraft is conducted to assure that a proposed aircraft type meets applicable Federal Aviation Regulations. The airworthiness standards which must be met for transport category aircraft are set out in Part 25 of the Federal Aviation Regulations. These extensive regulations, which in the present version of the Code of Federal Regulations occupy nearly 150 pages, prescribe the

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standards an aircraft must meet to be eligible for a type certificate.

Our airworthiness standards cover such broad categories as the aircraft structure, design and construction, powerplant equipment, as well as operating limitations and information. Within these broad categories are a host of subcategories. For example, with respect to the "powerplant" category, requirements are imposed for: the fuel system, fuel system components, oil system, cooling, induction system, exhaust system, powerplant control and accessories, and powerplant fire protection. Within each of these subcategories are numerous specified standards. By way of further illustration, under the heading of "induction system", regulatory standards are set for: air induction, induction system de-icing and anti-icing provisions, carburetor air and preheater design, induction system ducts, induction system screens, and inter-coolers and after coolers. I don't want to belabor the point but I believe it important to stress the comprehensive nature of the regulations an aircraft must meet, regulations established by public rulemaking. Generally speaking, the airworthiness requirements contained in the Federal Aviation Regulations are "result" or "performance" oriented. That is, they don't

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specify how compliance must be obtained but rather that a given result must be achieved. It is during the type certification of the aircraft that design and components are measured against the performance requirements established by the FAA.

As the members of the Subcommittee can see, literally thousands of engineering judgments and decisions are made by the FAA throughout the type certification of the aircraft. The amount of testing and evaluation conducted to enable us to make the compliance decisions is staggering. Unless we are convinced that an aircraft satisfies each applicable standard, a type certificate will not be granted the applicant.

There is an added feature in the process that allows the FAA to go beyond our prescribed standards, if necessary. We specifically provide in our regulations for "special conditions" to be imposed when the FAA concludes our airworthiness standards are either inadequate or inappropriate because of a novel or unusual design feature. The special condition enables us to establish a level of safety for the feature equivalent to that prescribed by our regulations.

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Having provided you with essential background, let me address the ALPA request for "openess" in more detail.

ALPA's position, at least as it has been expressed to me, has been to hold hearings during the certification of the aircraft. You are correct in noting our most strenuous objection to holding hearings as they have asked. As I expressed before, the certification process, because of its thorough nature and the complexity of the matters examined, requires literally thousands of engineering decisions before the ultimate decision can be reached to issue a type certificate. To subject each and every decision that must be made in this process to an adversary hearing would be entirely unrealistic and unmanageable. Consider, for example, that for original type certification of the DC-10-10 airplane, the first of the series, the following were produced by McDonnell-Douglas and approved by the FAA: 1,400 engineering reports and revisions; 150 vendor reports; 80 ground tests; 1,200 letters to the FAA; and 190,000 drawings and drawing changes.

The process of finding compliance with each of the requirements extends over a period of several years. It is not a highly structured process but, rather, involves continuous interaction

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between FAA and the manufacturer. Decisions necessary to the issuance of the type certificate are made at all stages of the process and range in form from discrete decisions reached on the basis of an applicant's formal presentation of design information to the FAA to the simple recording by FAA of its satisfaction with an accumulation of design data received and analyzed over an extended period of time. The FAA decision maker may be an individual engineer or a group dealing with a particular phase of the design. Only when every facet of the design covered by the regulations (and the Special Conditions which may be issued) has been approved, will a type certificate be issued.

It is conceivable that our use of the term Type Certification Board may have given rise to the impression that the type certification process is a rigidly structured series of "hearings" amenable to the inclusion of third parties without undue disruption of the process. This is not the case; the Type Certification Board for a project is established primarily to provide a mechanism for directing FAA effort as well as to establish a forum in which the applicant may present data and plans so that FAA can effectively coordinate its efforts. The Board is convened and operates in a purely ad hoc manner. While a problem may be identified during a Board meeting, the

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purpose of the Board is not to make findings of compliance with specific regulations; the cognizant engineers have that responsibility, subject to approval of their superiors.

Assuming a hearing were held just prior to the issuance of the type certificate, after FAA has found compliance with all the regulatory requirements, it is difficult to imagine the purpose of such a hearing unless each of those decisions were open to challenge through an adversary presentation of evidence, a process that could go on interminably.

On the other hand, some may believe that the FAA should defer each and every decision until a hearing is held, at which time the applicant and others would present evidence on each of the regulatory requirements, seriatum; a process that would take equally long. Or perhaps some would wish to have a series of hearings during the period of processing the application. The logistics of such a requirement boggle the imagination.

Even assuming that hearings could be practicably conducted, there remains the issue of affording confidentiality to proprietary data of manufacturers. Throughout the type certification process, documentation is received from manufacturers which could be damaging to their competitive

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position if revealed to others. These documents may be engineering designs, reports, or a myriad of other types of information.

Congress has specifically exempted trade secrets and other commercially valuable information submitted in confidence from disclosure under the Freedom of Information Act. Further, it is the policy of the Department of Transportation that such confidentiality be preserved. I fully support that view in the case of materials submitted for FAA consideration during our type certification proceedings.

At this juncture, and after repeated meetings with ALPA, I have no evidence which demonstrates to me that the revelation of manufacturers' confidential data will in any way enhance the public good. In fact, it is my firmly held belief that it would be detrimental to the posture of the U.S. aviation industry to open their trade secrets to competing manufacturers.

I note that ALPA's president has recently been quoted in the press to the effect that ALPA does not favor indiscriminate disclosure of all manufacturer data but, rather, wishes to

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review the certification data on "specific aspects of the design at key points in the process." Accepting for the sake of argument that this were feasible, what this amounts to is a request for a privilege. Let me elaborate on how I view this approach.

Let me reference once again the fact that, confidential design information is exempt from mandatory disclosure under the Freedom of Information Act. The courts will not compel its disclosure. When we receive a request for such information, we solicit the view of the party from whom we received the information on its status under the exemption. A procedure, I should add, that was recently endorsed by the Committee on Government Operations in House Report No. 95-1382. If that party objects, we evaluate the reasoning for it and decide whether or not the information is exempt. If it is not exempt, we must release it to anyone who asks for it -- we are not permitted to take into account who is requesting it. For example, the recent request made by ALPA for DC-9 information fell into this category; the manufacturer objected in principle to disclosure but did not convince us that competitive harm could result. Therefore, that information was released to ALPA and is available to anyone who seeks it.

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On the other hand, if we are persuaded that disclosure is likely to cause competitive harm, the information is exempt and disclosure is not required -- in short, the Freedom of Information Act does not apply to that information. The result is that disclosure, then, is a matter of discretion. But, let me emphasize that we do not have unfettered discretion in this matter. We must act responsibly to balance the public and private interests involved.

It is my view that the predominant public interest consideration in this matter, aviation safety, is more than adequately represented by FAA. The interjection of a third party, especially one with recognized private interests in the final certification decision, to review the data and comment on its sufficiency vis-a-vis the applicable rules would add little but confusion and delay to the process. Let me add that ALPA has a standing invitation to submit whatever data it considers relevant to any certification decision facing the FAA. We will give thorough consideration to any such submission. It is not, in my view, necessary to the usefulness of such data that it be presented in direct contrast to detailed design data submitted by the manufacturer; I am convinced that we can make the necessary connections that will establish its relevancy.

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But, suppose we do turn over certain of the manufacturer's data to ALPA or to others for rebuttal, so to speak. At that point, we have no further control over it -- ALPA is free to do with it as they choose. We have no way of subsequently policing or enforcing restrictions on the later use of that data. Further, I think we would be on thin ice, indeed, should we subsequently try to deny that same information to another requester.

To sum up, Mr. Chairman, further "opening" up the type certification process, in the manner some would have us do, would be disruptive of a system that works well. By disrupting a process already long and tedious and thereby extending its time frame even further, new technology aircraft would be delayed in entering the marketplace. Consequently, as I see it, the public would be harmed by deferring the introduction of new and innovative safety features as well as the greater energy efficiency, reductions in noise levels, and jobs that result from new technology aircraft production. Further, substantial harm would result to the U.S. predominance in aviation from baring U.S. aircraft manufacturers' trade secrets to the world. I should also add that the type certification process is already a very costly one for the manufacturers and that ultimately the consumer bears this burden. With the

existing cost of transport category aircraft, I don't think we should add to inflationary pressures without demonstrable benefits associated with the added burdens.

I am open to suggestions as to ways in which our type certification process might be improved; but unless somebody can describe to me a way in which our long processes will not be further delayed, in which information that should be protected will be kept confidential, and in which meaningful results would, in fact, obtain, I remain convinced that paying heed to the special interests by holding hearings would not serve the public well. I would add further that the FAA stands ready to give serious consideration to any petitions for rulemaking from the public designed to change Part 25.
That concludes my prepared statement, Mr. Chairman. I am available to respond to questions you or Members of the Subcommittee may have.

[Whereupon, the subcommittee recessed, to reconvene at 1:30 p.m., the same day.]

AFTERNOON SESSION

Mr. BURTON. We will reconvene.

Before we get into the Cockroach dry lease situation, we did want to ask you a couple of questions for the record on the MLS situation.

We sent you a letter dated August 8, 1978. We received a letter from you on September 11 which prompted some questions. In that letter, as I recall, you describe a meeting with the ICAO Secretariat concerning the development of ICAO standards and recommended practices. What power would the ICAO Secretariat have over this matter concerning MLS?

Mr. BOND. Mr. Chairman, this has taken me a little off balance because I was not prepared to discuss this issue now.

Mr. BURTON. Would you rather we submit these questions to you?

Mr. BOND. If we have someone with us who can answer that, we will answer now. I don't think we do. However, I will be happy to answer the questions.

Mr. BURTON. Mr. Francis was advised that we were going to ask some questions on this. If you don't have the technical material——

Mr. BOND. Mr. Albrecht was here this morning. I am sorry he did not stay, but I let him leave.

Mr. BURTON. What we will do is put these specific questions in a letter, and we would like to have some specific answers.

Without objection, the record will remain open at this point for the purpose of inserting this additional material upon its receipt.

[The material follows:]

36-953 O - 79 - 29

August 8, 1978

The Honorable Langhorne Bond
Administrator
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D. C. 20590

Dear Mr. Administrator:

As you well remember, the subcommittee conducted an intensive investigation of the FAA's procurement of a Microwave Landing System (MLS) and of the controversy which had enveloped the ICAO selection process. The investigation involved three days of hearings, and a comprehensive report.

We were all relieved to see the controversy settled by the ICAO decision in April of this year. The subcommittee staff, who attended the AWO meeting, came away with the impression that this was, indeed, the "final round" in the controversy. I also understand that, in his closing remarks, the head of the British delegation clearly indicated the U.K.'s acceptance of the ICAO decision for TRSB. In fact, the U.K. seems to have completely laid aside opposition, even to the point where the primary DMLS contractor, the Plessey Company, is about to sign an agreement with the primary TRSB contractor, the Bendix Corporation, for the development of TRSB. I am further advised that the only remaining step for ICAO to take is the non-political, technical preparation of the Standards and Recommended Practices (SARPS), which may take at least three years, rather than 18 months as set out in the recently updated "National Plan for Development of the Microwave Landing System." The preparation of SARPS may not preclude your proceeding with installation of MLS in the U.S., and if it does, I would appreciate a detailed explanation of why. At the very least, there should be a strong U.S. initiative within the ICAO process to begin and complete preparation of SARPS. I am not aware of any such initiatives currently being taken.

In short, there are also strong indications that the international community has now agreed upon TRSB as the signal format for international standardization; that the "fight" is, indeed, finally over.

It is now rumored that you have decided either to delay implementation of MLS in the U.S., or have decided to choose an implementation plan which moves at a much slower pace than intensity of your feelings during our hearings led me to expect. I do not know exactly what your decision is, or even if you have made one, but I would like a clarification of your position on MLS implementation.

I would be shocked if your position is that the MLS implementation in the United States should be delayed. Such a decision would be in complete conflict with statements made by yourself and by other members of your Administration before this subcommittee during its January and February, 1978, hearings.

During those hearings, the FAA repeatedly stressed the value to aviation safety of MLS, particularly if the system chosen by ICAO were TRSB. You informed us of a unique and pressing need on the part of the United States for MLS. For example, when asked by a subcommittee member to respond to an earlier statement by Congressman Harkin that the FAA should not be a promoter of any particular system until it had been fully tested, you made the following statement:

> "That is the essence of what Congressman Harkin wants... I do not think that is right. I think it would make an unconscionable delay in the implementation of microwave landing systems, which would be especially acute in the United States.
>
> "The numbers that we have presented to this Committee indicate that our need is enormous. We have 600-and-some compared to only 43 in Britain, and they do not need it right now because they do not have that much aviation in the United Kingdom. We have a lot..." (Hearings, p. 354)

Earlier, you had indicated that the "enormous need" was at small airports where no instrument landing systems exist, and that the implementation of an MLS after the ICAO decision would be rapid:

> "...to reiterate, first, we would probably install it in the smaller communities since they have none at all and it is likely that over a period of years it will replace ILS at the larger and more complex hubs.

"That is the general strategy. You would probably go from the country to the city, if you like.

"So we would probably start installing it, I would say, fairly promptly." (Hearings, p. 151)

Similar statements were made in several working papers submitted by the U.S. delegation to the All Weather Operations Divisional Meeting in April, 1978 (See WP/15, 19, 41, 42, and 104). In these papers, the need for an immediate ICAO decision on MLS was stressed along with the pressing need for rapid implementation of MLS in small airports, particularly in the U.S.

The possibility of a delayed implementation of MLS greatly troubles me. If implementation is to be delayed, it seems that I am left with but three possible explanations for this decision: First, that CAA/Plessey claims about TRSB performance were correct, and that the equipment cannot be implemented because of cost or capability; second, that there is no pressing need for MLS in the U.S.; or, third, that organized economic interests are reluctant to make the necessary investments and are pressuring for a delay.

If any case is true, statements by yourself and other FAA representatives before this subcommittee were then erroneous and misleading.

I would appreciate a full response to this inquiry as soon as possible, so that these serious questions may be put to rest.

Sincerely,

JOHN L. BURTON
Chairman

JLB:BRB:jy

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

OFFICE OF
THE ADMINISTRATOR

SEP 11 1978

Honorable John L. Burton
Chairman, Subcommittee on Government
Activities and Transportation
Committee on Government Operations
House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

I am in receipt of your letter of August 8 concerning the Time Reference Scanning Beam (TRSB) Microwave Landing System (MLS) Program and am aware of your concerns about our plans for the furtherance of this program. I can assure you that we are moving ahead with this program in both a timely and responsible manner. As you are fully aware, the international facets of a program such as this require careful attention so that our actions are perceived in the proper light by other countries. In addition to the international activities taking place, we are working domestically to set in place the necessary planning and technical documentation through which the users will become full and viable partners in the program's execution. To allay your concerns, let me briefly elaborate on the various actions underway domestically and in the international arena to complete this program.

We have met with the Secretariat of the International Civil Aviation Organization (ICAO) concerning the plan for the preparation, review, and approval of the Standards and Recommended Practices (SARPS). While the Secretariat cannot officially take a position on multilateral matters, they saw no apparent difficulty which would preclude the completion of the process by the end of 1979. They are proceeding to take the necessary actions to reactivate the All Weather Operations Panel process and have solicited comments from all members on a procedure which should minimize the need for formal meetings and reduce the time needed for this phase of the SARPS process.

We have completed a draft version of the SARPS and will be meeting with the Australians to arrive at a joint position prior to presenting them to ICAO for distribution to other Panel Members. At this time, we believe the SARPS activity is proceeding in an orderly and timely manner. A major problem in meeting the aforementioned schedule could arise, however, if the international community were to misunderstand the actions set in motion to meet our domestic requirements, and interpret those as a "threat" to its amortization of an investment in the Instrument Landing System (ILS). We are being especially watchful of our actions to be sure that such a perception does not develop.

With respect to the implementation of MLS in the United States, we are satisfied that development efforts are mature, and that no technical or cost factors will hinder implementation. There is a possibility that ICAO could adopt a SARPS that differs somewhat from the draft we have prepared. Any difference probably would pertain to the signal-in-space and message format, which would not necessarily imply a hardware change, but could necessitate a logic change. We do not see this as a major problem, but, depending upon the specific area of difference and timing, it could require modification of systems procured under our specification. For this reason, we are anxious to maintain the expedited schedule for the SARPS process so that it will be compatible with the timely implementation of MLS in the United States and other countries with similar requirements.

We are proceeding with our domestic implementation planning, although, this may not be readily apparent since we have not yet begun a production procurement effort.

We are finalizing a Transition Plan and have a draft revision to Part 171 of the Federal Aviation Regulations (FAR) well underway. The former document defines the optimum methodology for implementation of MLS based on economic factors. This plan will be followed by an Implementation Plan which will specify actual sites for installation and a year-by-year installation schedule. FAR Part 171 governs the operation of Non-Federal Navigation Aids, and our actions underway to revise these regulations will include MLS in that document. We also have made significant progress towards the initiation of a System Test and Evaluation Program (STEP), which will put facilities in the field for user familiarization and permit FAA to gain additional information for optimizing siting criteria, maintenance standards, and to gain further data upon the technical parameters associated with maintainability and reliability. Those elements will serve to further enhance, in an evolutionary manner, the installation and operation of follow-on production units.

The various United States manufacturers of electronic equipment are actively engaged in consummating international agreements for licenses to manufacture TRSB MLS. We are not aware of any pressures, economic or otherwise, to delay the implementation program. Several manufacturers have called to our attention the need to continue the momentum of the program, and I believe they are cognizant of our activities and, recognizing the realities of the situation, are, on the whole, satisfied with our progress.

To sum up, we are proceeding on a responsible schedule and through it, I believe, we will meet the requirements for TRSB MLS in a timely fashion.

Sincerely,

[Signed] Langhorne Bond
Administrator

Mr. BURTON. Why don't you proceed as you wish with your prepared statement on the dry lease situation?

Mr. BOND. I will summarize my statement in view of the fact that it has been entered into the record.

On my left and on your right is Mr. Phillip Swatek, who is the Director of the southern region of FAA in Atlanta. On my right is Mr. Jonathan Howe, who is the Deputy Chief Counsel of the FAA and formerly the regional counsel in Seattle.

I have one item that I would like to place in the record, which has been signed by Secretary Brock Adams this morning. This is a transmission to the Congress of a piece of legislation to which we allude in our testimony. Basically, it strengthens the FAA's enforcement powers in the field that we are about to discuss.

Mr. BURTON. Without objection, the record will remain open for the purpose of inserting this material at this point.

[The material follows:]

OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

SEP 28 1978

Honorable Walter F. Mondale
President of the Senate
Washington, D. C. 20510

IDENTICAL LETTER TO:
Honorable Thomas P. O'Neill, Jr.
Speaker of the House of Representatives
Washington, D. C. 20515

Dear Mr. President:

Enclosed for introduction and referral to the appropriate committee is a draft bill

> "To amend title 49, United States Code, to provide additional criminal penalties for safety violations; to increase civil penalty limits; and for other purposes."

The primary intent of the Department of Transportation in proposing this legislation amending sections 901 and 902 of the Federal Aviation Act of 1958, as amended, (49 U.S.C. §§1471-1472), is to combat violations of the Federal Aviation Act and regulations and orders issued thereunder. In recent years the Department has been investigating a significant number of commercial operations and has found frequent violations of provisions of the Federal Aviation Act and the regulations and orders issued pursuant thereto. As an attempt at deterring future violations, this legislation has been drafted with a keen awareness of the needs of aviation safety.

Specifically, the bill would increase the maximum civil penalties in section 901 from $1,000 to $25,000 and amend section 902 to apply criminal penalties for the violation of safety provisions of title VI of the Federal Aviation Act. Criminal sanctions would also attach to commercial operators and others who fail to file reports with the Civil Aeronautics Board or Secretary of Transportation, fail to keep required records, or falsify any such reports or data. Further, the bill provides for civil rather than criminal penalties for violations of section 1101 of the Federal Aviation Act, relating to notification of proposed construction, and authorizes the Secretary of Transportation to compromise such civil penalties as may be imposed.

Section 901(a) of the Federal Aviation Act currently provides for a civil penalty not to exceed $1,000 for each violation of titles III, IV, V, VI, VII, or XII of the Act, section 1114 of the Act, or any regulations or orders promulgated pursuant thereto or under section 1002(i). We are convinced that the prescribed maximum penalty is an inadequate deterrent to such violations. For example, our investigations have shown that many unlawful commercial operators assume the $1,000 civil penalty as a cost of doing business and continue to operate illegally at substantial profits. Therefore, section 1 of this draft bill would increase the maximum penalty to $25,000 to increase the economic disincentive to maintain these unlawful commercial operations. The section also provides for the imposition of civil penalties for the violation of section 1101 of the Act.

Section 901 of the Federal Aviation Act provides a valuable enforcement tool frequently used by the Department's Federal Aviation Administration. Increasing the civil penalty limits for each violation of the above-enumerated titles of the Act and the regulations and orders promulgated pursuant thereto, therefore, would not be confined to imposing sanctions for unlawful commercial operations. For instance, the Department could usefully employ these increased civil penalty limits to enforce provisions of Parts 121 and 107 of the Federal Aviation Regulations which pertain to aircraft and airport security. This bill retains the provision of section 901(a)(2) whereby the Secretary of Transportation may compromise such civil penalties as may be imposed.

Section 2 of the bill provides the Secretary of Transportation with authority to compromise civil penalties which may be imposed for violation of section 1101 of title XI. This would provide the Department with needed flexibility in the enforcement of section 1101.

Section 3 of the bill amends section 902 to provide criminal penalties for any willful and knowing violation of title VI of the Federal Aviation Act or rules or regulations issued thereunder. Since title VI provides the basis for the safety regulation of civil aeronautics, it is particularly important that adequate penalties exist to deter persons from violating provisions of the title. We believe that criminal penalties will provide such an effective deterrent. Furthermore, section 3 would raise the monetary penalty for violations of section 902 and subject violators to imprisonment. The section would also amend section 902 to remove the criminal penalty sanctions which can presently be imposed when persons fail to provide the Secretary of Transportation with notice of proposed construction in accordance with section 1101 of the Act. We have found that criminal sanctions are impractical in these cases and believe that civil penalties, as would be authorized by section 1 of the bill, would be more effective.

Section 4 of the bill amends section 902(e) of the Act. That section currently provides criminal penalties for air carriers (or any officer, agent, employee, or representative thereof) who knowingly and willfully refuse or fail to file required reports, fail to keep required data, or falsify or mutilate required reports. This amendment would place commercial operators and others within the purview of this section. Additionally, the section would be amended to increase the monetary penalty for violations of this section and subject violators to imprisonment for not more than one year. We feel that this amendment is vitally needed in view of past experiences which have revealed instances of such conduct by commercial operators. We see no reason to excuse them, or others for that matter, from this responsibility.

It is the judgment of the Department, based on available data, that no significant environmental impact would result from the implementation of this legislation.

The Office of Management and Budget advises that, from the standpoint of the Administration's program, there is no objection to the enactment of this legislative proposal.

Sincerely,

Brock Adams

Enclosures:
Draft bill
Section-by-Section Analysis

A BILL

To amend title 49, United States Code, to provide additional criminal penalties for safety violations; to increase civil penalty limits; and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the first sentence of section 901(a)(1) of the Federal Aviation Act of 1958 (49 U.S.C. §1471 (a)(1)) is amended to read as follows:

"Any person who violates (A) any provision of title III, IV, V, VI, VII, or XII or of section 1101 or 1114, of this Act, or any rule, regulation, or order issued thereunder, or under section 1002(i), or any term, condition, or limitation of any permit or certificate issued under title IV, or (B) any rule or regulation issued by the Postmaster General under this Act, shall be subject to a civil penalty of not to exceed $25,000 for each such violation."

SEC. 2. Section 901(a)(2) of the Federal Aviation Act of 1958 (49 U.S.C. §1471(a)(2)) is amended by inserting "or of section 1101 of title XI," into the first sentence so that it reads in part: "Any such civil penalty may be compromised by the Secretary of Transportation in the case of violations of titles III, V, VI, or XII, or of section 1101 of title XI, . . ."

SEC. 3. Section 902(a) of the Federal Aviation Act of 1958 (49 U.S.C. §1472(a)) is amended by deleting present section 902(a) and by adding the following in lieu thereof:

"SEC. 902(a) Any person who knowingly and willfully violates any provision of this Act (except titles III, V, VII, and XII and section 1101 of title XI), or any order, rule, or regulation issued by the Administrator or by the Board under any such provision or any term, condition, or limitation of any certificate or permit issued under title IV, for which no penalty is otherwise provided in this section or in section 904, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be subject to a fine of not more than $25,000 or to imprisonment for not more than one year, or both. If such violation is a continuing one, each day of such violation shall constitute a separate offense."

SEC. 4. Section 902(e) of the Federal Aviation Act of 1958 (49 U.S.C. §1472(e)) is amended to read as follows:

"(e) Any person who shall knowingly and willfully fail or refuse to make a report to the Board or Secretary of Transportation as required by this Act, or to keep or preserve accounts, records, and memoranda in the form and manner prescribed or approved by the Board or Secretary of Transportation, or shall knowingly and willfully falsify, mutilate, or alter any such report, account, record, or memorandum, or shall knowingly and willfully file any false report, account, record, or memorandum, shall be deemed guilty of a misdemeanor and, upon conviction thereof, be subject for each offense to a fine of not less than $100 and not more than $25,000 or to imprisonment for not more than one year, or both."

SECTION-BY-SECTION ANALYSIS OF A BILL

Section 1. This section amends section 901(a)(1) of the Federal Aviation Act of 1958, as amended (49 U.S.C. §1471(a)(1)) to increase the civil penalty limits for each violation of the provisions of titles III, IV, V, VI, VII, or XII of the Act, section 1002(i) of the Act, and the regulations and orders promulgated pursuant thereto, from $1,000 to $25,000. Past Department investigations of commercial operations have shown that the existing penalty of $1,000 is an inadequate deterrent to future violations of these provisions, since many commercial operators accept this penalty as a cost of doing business. The proposed increase in penalties to $25,000 for each violation would potentially eliminate the profit in most of these unlawful operations. Increasing the civil penalty limits for each violation would, of course, not be confined to imposing sanctions on commercial operations, as the increased limits would apply to violations of the above enumerated titles and all regulations and orders promulgated pursuant thereto. The section also adds the violation of section 1101 of the Act, which relates to notification of construction of hazards to air navigation, as a basis for imposing civil penalties.

Section 2. This section amends section 901(a)(2) of the Act (49 U.S.C. §1471(a)(2)) to authorize the Secretary of Transportation to compromise civil penalties which may be imposed for violations of section 1101 of title XI. This parallels existing authority to compromise civil penalties for violations of other provisions of the Act and is necessary in view of

sections 1 and 3 of the draft bill which remove criminal sanctions for violations of section 1101 and authorize the imposition of civil penalties instead.

Section 3. This section amends section 902(a) of the Act (49 U.S.C. §1472(a)) to provide criminal penalties for the violation of provisions of title VI of the Act as well as of rules or regulations issued thereunder. The sanctions imposed by this amendment would consist of a fine not to exceed $25,000 or imprisonment not to exceed one year, or both. This section also amends section 902(a) to remove the criminal penalty sanctions which can presently be imposed for violations of section 1101 of the Act. Further, the section does away with the present distinction between penalties for first offenders and subsequent offenders.

Section 4. This section amends section 902(e) of the Act (49 U.S.C. §1472(e)) to provide criminal penalties in amounts ranging from $100 to $25,000 for anyone who knowingly and willfully refuses or fails to file required reports, fails to keep required data, or falsifies or mutilates required reports. Moreover, imprisonment not to exceed one year could be imposed. Section 902(e) currently applies to air carriers only. This proposed amendment would place commercial operators and others within the purview of this section as well as bolster the criminal penalties which may be imposed for violation of section 902(e).

Mr. BURTON. That is for action in the next Congress, I suspect.

Mr. BOND. I am sure that is the case; yes.

Perhaps you would like to just proceed to questions, Mr. Chairman.

Mr. BURTON. Can you simply outline what he is asking for?

Mr. BOND. Yes. Jonathan Howe can.

Mr. HOWE. Mr. Chairman, basically we are proposing two separate pieces of legislation. The first is to increase the statutory limit on civil penalties from $1,000 to $25,000. The present statutory limit is the same as was enacted in the original Civil Aeronautics Act of 1938, and it has not changed since that time. We believe that the $25,000 civil penalty limit will be a more effective deterrent to the prosecution of the types of cases that the committee is concerned with.

The other proposal is even more widesweeping. We believe it is very important. That is the criminalization of title VI. In that we specifically propose that willful and intentional violations of title VI which encompass all of the safety regulations and safety statutes of the FAA would be subject to criminal sanctions and criminal enforcement. Those are the primary provisions of this legislation.

Mr. BURTON. In your testimony you mention the Admiral Smith report. The major recommendation of this report was to create a new set of rules for the operation of large aircraft which would be comparable to FAR part 121. According to the GAO, and according to your statement as I interpret it, you didn't do this even though you worked to established subpart (d) for part 91. It really hasn't been made equivalent to part 121.

In other words, you really didn't follow the Smith report recommendation.

Mr. HOWE. Mr. Chairman, we believe that we did follow the recommendations of the Smith report. The Smith report initially recommended and recognized the fact that some regulatory changes would be necessary and a period of trial or experience would be necessary to determine whether that would provide a sufficient level of safety.

Subpart (d) which essentially comported with the Smith report recommendations, came out as a result of that. We have operated under subpart (d) for approximately 6 years, and we have found that subpart (d) with regard to certain categories of operation, especially those involving corporate and business aircraft, has provided an acceptable level of safety.

However, so far as larger aircraft of the type that the committee is concerned with, we think that improvements can be made.

Mr. BURTON. How long will it take you to figure that out?

Mr. HOWE. Mr. Chairman, we have been investigating and litigating cases arising under our regulations for some years. We have discovered that particularly in the past 6 years the difficulties involved in piercing leasing schemes, ruses, and similar types of methods to circumvent the applicability of subpart (d) has just been an inappropriate method of enforcement. We believe that the elimination of compensation or hire entirely as a prerequisite for operations of these large aircraft is the appropriate type of regulation. That is what we are presently studying.

Mr. BURTON. Didn't the major recommendation of the Smith report say to create a set of rules that would be comparable to FAR part 121?

Mr. HOWE. Yes; one of his recommendations was that particularly in certain areas the regulations be upgraded to more closely approximate 121.

Mr. BURTON. Do you think by any stretch of the imagination part 91(d) did this?

Mr. HOWE. I think 91(d) was a significant improvement over the previous regulations.

Mr. BURTON. A significant improvement in a darkroom is lighting a match, but it does not come close to these television lights. Do you think part 91(d) met the basic recommendation of the Smith report? Or was it that you had such a bad situation that anything was a significant improvement?

Their recommendation was to create a set of rules that would be comparable to 121.

Mr. HOWE. Mr. Chairman, I think the benefit of hindsight has indicated to us that the subpart (d) was not adequate.

Mr. BURTON. On the face of it, did you really think it was comparable to 121 when you put it in?

Mr. HOWE. Sir, I cannot speak for those who wrote the rule, but I can certainly say that at the time that subpart (d) came into existence, both from the standpoint of the FAA and the operators operating under that rule, it was a significant change, a significant departure from the old methods of maintaining and operating a large aircraft under 91. It did come very close in many respects to many of the requirements of 121. It is since that time that we have discovered that many ingenious operators have found ways to circumvent those requirements.

Mr. BURTON. Now you say you are studying a rule after 6 years to try to get into the parts that 91(d) didn't deal with.

What do you mean you are "studying" it?

Shouldn't you be putting out an NPRM, rather than studying it?

Mr. HOWE. That is exactly what we are doing, Mr. Chairman. We have a project that we are assessing at the present time to determine what portions of 121 are appropriate to this category of operation and what portions of 121 are not appropriate. We are planning a notice of proposed rulemaking within the next several months which will put this out for comment.

Mr. BURTON. Was there any kind of resistance during the rulemaking process for the current 91(d)?

Mr. HOWE. We received many, many comments, Mr. Chairman, concerning the proposed 91(d) rule; yes, sir.

Mr. BURTON. What kind of comments? In opposition? Was there strong opposition?

Mr. HOWE. Yes; there was a considerable amount of opposition from many of the operators of large aircraft. Many, I might add, that were operating then and today at a very high, very proper level of safety, especially in the corporate and business community. They felt that no additional regulations were necessary for their category of operation. They did oppose the additional requirements.

Mr. BURTON. What kind of opposition do you think you are going to run into when you try to upgrade them now?

Mr. HOWE. I am really not prepared to predict that at this time.

Mr. BURTON. Are you prepared to predict that, notwithstanding the opposition from the people that we tre trying to regulate, that

we are going to do what is right for the public good and in keeping with your aviation safety mandate?

Mr. HOWE. That certainly is our intention, yes.

Mr. BURTON. If there wasn't a problem, you wouldn't have to do it. And, if these people were doing it voluntarily, there wouldn't be a problem. So, I am always worried when it comes to writing safety regulations we take into concern those whose activities we are trying to correct for the public's safety.

You are familiar with the GAO statement about the safety record of these operators are you not?

Mr. HOWE. Yes, I am, Mr. Chairman.

Mr. BURTON. Do feel that they are correct in stating that there is an increasing safety problem?

Mr. HOWE. Mr. Chairman, I do not believe that that is the case but Mr. Swatek is much more familiar with the particular operations that they describe. I would like, then, to defer to Mr. Swatek to comment on that.

Mr. BURTON. You don't believe there is a safety problem, or that it is increasing?

Mr. HOWE. I believe there is a safety problem. I have seen no statistics to indicate that it has been increasing at an alarming rate; no, sir.

Mr. BURTON. What is your definition of an "alarming rate"?

Mr. HOWE. A significant change from the previous rate.

Mr. BURTON. Was the previous rate—I see. OK. It is just an ongoing problem?

Mr. HOWE. That is correct; yes, sir.

Mr. BURTON. Would you comment?

Mr. SWATEK. Mr. Chairman, from the records we have, and we are reluctant to say it, but I think the safety rate is improving. It is not good.

Mr. BURTON. Among dry lease operators now?

Mr. SWATEK. Yes. For example, we have had a number of accidents this year—it is true. Four of them, for example, have involved illicit drug operations. There have been some bizarre conditions about each one of them. They have landed on a country road at night or done something like that, but each one of those is part of the record.

I think that those who are in the ordinary cargo business are doing better.

Mr. BURTON. Why would they go through these elaborate schemes except to avoid safety regulations?

Mr. SWATEK. As was described this morning, it is a matter of economics. They can proceeed with less expense if they do not have to conform to all of the requirements of 121. I am sure it boils down to dollars and cents eventually.

Mr. BURTON. Eventually, it boils down to human lives.

Mr. SWATEK. That is true, too.

You have my statement. I certainly am not going to go through it unless, of course, you would like me to.

Mr. BURTON. If you wish to summarize, that will be fine.

Without objection, your entire statement will be made a part of the record at this point.

[Mr. Swatek's prepared statement follows:]

PREPARED STATEMENT OF PHILLIP M. SWATEK, DIRECTOR, SOUTHERN REGION, FEDERAL AVIATION ADMINISTRATION

Mr. Chairman and Members of the Subcommittee:

My name is Phillip Swatek and I am Director of FAA's Southern Region. The Southern Region has jurisdiction over FAA activities in the eight southeastern states of the United States, the Caribbean and Central and South America. I would like to supplement Mr. Bond's remarks concerning the operation of large aircraft in the Miami area, to provide more detail about the history and nature of those operations.

Following World War II, surplus military airplanes and ex-military airmen were at airports in many sections of the country trying to get started in the aviation industry, but as our domestic ground-based transportation system developed along with scheduled airlines, they were pushed toward the "gateway" cities and into shipping operations that trucks, railroads and scheduled airlines either couldn't or decided not to handle. Slowly the number of involved gateway cities diminished, particularly in the North and in the West until

today it has become mostly a southern enterprise. At this time, Miami, or certainly South Florida, has nearly half of this activity in the entire country. Technically, it is not just Miami. Fort Lauderdale International could be viewed in much the same way in regard to non-certificated non-scheduled air cargo operations, only about one third the size. But to keep the subject focused, we will talk only of Miami.

The most obvious part of the answer to the question, "Why Miami?" is shown on a map of the Western Hemisphere. The Florida peninsula penetrates deeply toward the market to the south which has a strong need for air transportation, sometimes a critical need since the only alternative is water-borne shipping, more and more limited to container ships and major ports. Obviously Miami is the closest mainland airport to this market. The map also suggests that flying conditions are good, first in terms of warm weather which does not necessarily call for expensive hangar and heating equipment; and second, the map suggests that not only are the markets generally close to Miami on an hemispheric scale, but the islands enroute make convenient stepping stones. Because the need for air transportation from the U.S. to the Caribbean, Central and South America is great, and the aeronautical conditions for providing that service

with older airplanes so benign, business has grown dramatically, if unevenly, until the last few years, when it has grown both vigorously and evenly.

Perhaps a definition of the terms as we use them would be in order here. Anyone is allowed to transport his own goods in his own aircraft if those goods result from his principal business which cannot also be air transportation. An operating certificate is required only when the transport services are performed for others. To conduct legally flights for compensation or hire in large aircraft, the operator must possess an air carrier or a commercial operator operating certificate issued by FAA, both under FAR Part 121. The air carrier must also possess appropriate Civil Aeronautics Board authorization.

Again, a person may legally haul his own goods in his own aircraft provided also the aircraft is airworthy and operated by qualified airmen. The same holds true of a person who does not own an airplane but leases one to transport his own goods.

In either case the aircraft is operated under the general and flight rules of Part 91 of the Federal Aviation Regulations.

Subpart D of of this regulation contains rules for flight operation and inspection of large aircraft.

Some operators have entered into lease agreements with persons having goods to be transported which are really a subterfuge to get around the operating certificate requirements of FAR Part 121. Sometimes a lease may be in compliance with the truth-in-leasing requirements set forth by FAA, but the way the operation is conducted may not conform to operational control provisions in the lease. A typical example of this would be where the so called lessor provides that aircraft and directly or indirectly furnishes the crew. Some leased aircraft are properly operated.

Airworthiness standards for FAR 91 subpart D aircraft are the same as for a certificated airline aircraft. Both must conform with original type design requirements and be in a safe condition for flight. The difference is that there is a monitorable system for the airline airplane to make sure that it stays in good condition. The system, for example, requires a maintenance manual outlining quality control system, intervals for component overhauls, and other specific procedures which provide better checks and balances and allows for easier surveillance.

In considering the history of these operations in Miami, gradual but important changes in two areas are of particular interest. First, until recently there have been large fluctuations in the level of business from month to month and sometimes from year to year, not because the need for food and goods of all description in the islands and countries to the south ever changed much, but because of uncertain and often poor economic conditions there. A crisis situation, such as a dock strike on our East or Gulf coasts or at a principal harbor in the Caribbean, or a meat shortage in one of the larger countries south of us, has in the past generated an enormous demand for any kind of transportation and uncertificated air cargo operators in those conditions had good business. But often as not, the business peak was followed by a lean period. Fluctuations in business levels, plus an historic caution on the part of the Civil Aeronautics Board to certificate additional air carriers or authorize more air taxis to use large aircraft, probably did discourage many of these operators from seeking certification.

Of operational importance to us has been the changing nature of the fleet at Miami International, a change that causes us

great concern in one sense, but pleases us greatly in another. Following World War II, the non-certificated air cargo fleet was basically comprised of World War II airplanes such as C-47's, C-46's, DC-4's and the early Constellations. Then, as the certificated airlines replaced their piston airplanes with the first of the turboprops, we got into the Miami fleet DC-7's and the late model Constellations. But the most important change came when the first jets were being phased out of the certificated-airlines fleet and began showing up in the non-certificated air cargo fleet at Miami. Of course we in FAA were pleased that turbine-powered aircraft, which are far more productive and clearly more reliable than piston-driven airplanes, were coming into service. On the other hand, we were concerned because jet maintenance and operation requires more expensive equipment and more highly trained maintenance as well as flight personnel.

Going back two and three decades, FAA's surveillance intensified along with surges in non-certificated air cargo operations. I was involved in the last of the specially-mounted surveillance programs following the crash of a Constellation on takeoff December 15, 1973, often referred to as the "Christmas tree" accident. FAA maintained

round-the-clock surveillance of air cargo operations for four months, making 1,490 ramp inspections and expending some 3,500 employee hours following this accident caused by improper loading, until we were satisfied the operations were well within established safety limits. But generally in the past, our surveillance emphasis matched the level of flight activity.

Today, in addition to air cargo operators, there are now two major airlines, 110 air taxi operators, 12 of which operate large aircraft, 36 flight and ground schools and almost 200 certificated repair stations, 4,857 aircraft and 17,284 pilots in this historic aviation hub. Recently we have replaced special emphasis efforts for a more even surveillance of non-certificate air cargo activity. In the past 17 months, as part of the long-term program, we have conducted more than 790 aircraft ramp inspections and issued more than 175 aircraft condition notices. We have either by emergency order or by insisting on voluntary action by the owners, grounded more than 20 aircraft. Our inspectors have checked credentials of 912 airmen in the area.

Certainly we did not forget the importance of proper air carrier or commercial operator certification during this time. We understand that part of the long-range solution is

to identify all illegal operators of large aircraft and to require they get an appropriate certificate or stop operations. The Southern Region processed 32 violations involving non-certificated air carrier or commercial operators during the period from January 1973 through 1977 which resulted in civil penalties, injunctions by the Courts and cease and desist orders by the FAA. These 32 cases were one-third of all such cases processed in the nation during the same period. In the last two years, the Region has taken actions against South Florida large aircraft operators resulting in three injunctions, six cease and desist orders, and 12 emergency and non-emergency suspension of aircraft airwothiness and pilots' certificates. We summarily seized one aircraft. We or the courts on our application, have assessed $199,500 in civil penalties. Of these penalties, $47,500 has been or is being paid. The balance remain suspended unless the violators are found to be in violation of the same regulations within a year from the date of assessment.

While we have understood the importance of proceeding against those not holding appropriate certificates, the problem we faced through the years was how best to use our resources in keeping people from being hurt, both in airplanes and on the

ground, and we determined that our major emphasis should be on operational safety and in keeping marginal airplanes on the ground, no matter what kind of certificate they may or may not have had. It is discouraging to use up many, many employee hours in putting a scofflaw out of business, then to find the same airplane flying soon again under different colors, but that's what has happened.

But to keep pace with changing conditions, particularly the solid and accelerating growth of commercial activity, along with the changed regulatory environment and the changing makeup of the fleet, we have changed our strategy. In April 1977 we established as part of the Miami General Aviation District Office, a unique organization in FAA called the Transport Unit. It is a separate organization, now numbering 14 persons, housed in separate offices directly across the street from the area at Miami International known as "Cockroach Corner." This unit has as its primary responsibility the surveillance of all Part 91 large aircraft, as well as certificated repair stations serving the large aircraft these operators use.

In an attempt to clean up "Cockroach Corner," we have worked with the Dade County Aviation Department, and together we

have brought about the removal or destruction of at least 35 of the old hulks at Miami International.

Let me provide you with a few statistics on the safety record of the non-certificated cargo operators at Miami International. These statistics are not as precise as we would like because, unlike scheduled air carriers, non-certificated operators fly from all kinds of places on a very irregular basis and it is difficult to pin down an accident rate. For perspective, the Miami GADO holds the inspection program for approximately 250 large aircraft that are in the non-certificated air cargo business. The exact number changes almost daily. Of the approximate 250 total, usually on the order of 150 are stored in or operated in and out of the Miami area. The remaining 100 aircraft could be operating anywhere in the world, which makes surveillance difficult if not impossible. For example, a Lockheed 188--which is part of the accident history--had been operated by a foreign company between Costa Rica and Venezuela for months before it crashed off the coast of Panama on June 29, 1977, and we had no way of directly evaluating the operation.

Miami-based aircraft have been involved in 23 accidents we know of since January 1974, 15 of which occurred outside the U.S. Of the total 23, information available indicates that the primary cause of 12 was operational error; three were caused by airworthiness problems; and the cause for the remaining eight is undetermined. In nine cases, the flights were under foreign operational control. Drug running activity is suspected in six of the cases, four just in 1978. Because of the enormous potential profit from one drug haul, a pilot or operator can sacrifice his aircraft. And this has happened with increasing frequency and requires a different approach to enforcement responsibilities.

Miami-owned aircraft are leased to and operated by private companies not just in the Caribbean and Latin America, but in Europe, Africa and Asia. Some are leased to certificated foreign airline companies as well. Being U.S. registered aircraft, they are required to be maintained in accordance with U.S. standards through an aircraft inspection program necessary for all large aircraft. Routine surveillance and ramp checks are conducted by FAA International Field Offices overseas and maintenance is generally good. Cooperation by foreign civil air ministries has been impressive. Other large non-airline aircraft in the Miami area belong to brokers, one of whom on Miami International owned 30 at one time.

Once again, our surveillance of this industry in the past responded in large measure to the demands of the moment. We see now a different kind of environment and situation evolving from changes in regulatory philosophy and a more stable and growing market. Miami now is the second busiest airport in the United States in terms of international air cargo. The Dade County Aviation Department estimates that approximately 12% of all cargo handled at Miami International is handled by the non-scheduled, non-certificated cargo operators, or approximately 50,000 tons last year. Foreign carriers accounted for 60% of the total, U.S. certificated carriers the balance.

The emerging CAB regulatory philosophy will now permit operators to seek and get proper certification. On July 21, 1978, for example, the Civil Aeronautics Board took what we consider to be a bold and excellent step toward providing fully certificated carriers to fill the air cargo needs of South Florida. By exemption, the Board granted extensive scheduled cargo service authority to one company to serve several Caribbean and South and Central American markets. In the seven previous years only one had pursued and gained Board economic authority to serve the air cargo needs of the South Florida area.

I believe that our stabilized approach to the surveillance of a maturing aviation enterprise, against the backdrop of CAB's regulatory changes and the changes in FAA's approach as outlined by Mr. Bond, will serve the public and the industry well far into the future.

Mr. SWATEK. We have proceeded in a dual way, one having to do with processing illegal lease cases and the other having to do with the operational end of it or, as you say, lives.

We have had to do that because, as I think was described this morning, there are so many ways out of the lease situation. If we have to deal with U.S. attorneys and courts, it will be years before anything happens after we take the action. Or, it can be that if we finally corner an illegal operator, he sells the aircraft and it is at work in the same airport the next day with somebody new.

Or, as somebody mentioned, they can go into business with somebody in Guiana or Antigua or something like that and get a foreign air carrier permit, and they are back.

In addition to that, they can have a perfectly good lease and still have accidents. As a matter of fact, the worse we have ever had was the Boeing 707 in Santa Cruz, Bolivia. That had a perfectly good lease.

The most bizarre incident we have had at the South Port area was where a C–46 was taking off. The pilot knew he had a bad engine. He had a good lease.

Mr. BURTON. What is a good lease?

Mr. SWATEK. One that is legal.

Mr. BURTON. If I properly lease my plane to a resort down in the Caribbean and another corporation properly leases the crew, I am properly able to have people on board who are not protected by the stringent safety standards that they should be. So we are not talking about an illegal lease. We are talking about the lease can be legal. But the problem is that the safety regulations don't make them adhere to the higher standard.

Mr. SWATEK. Mr. Chairman, I agree with you 110 percent. We are not indifferent to violations of any of our regulations.

Mr. BURTON. But the regulation isn't strong enough. That is the point we are making.

Mr. SWATEK. I agree. That is what the Administrator is proposing, too.

I am saying that, in the meantime, we did not forget the operational part of it. In fact, if we had to make a decision on what we did first, we went after those operational matters that kept the airplanes from falling on people.

There has been a reference here to the different philosophies and different approaches from one region to another. I don't really think that is so, but I think the problem is that the conditions were so different. The volume of business we do in Miami was mentioned—there is just nothing like it.

Mr. BURTON. Shouldn't you ask for more staff?

Mr. SWATEK. We have this transport unit now which has 14 people in it. That is just about half of all the people in the general aviation office in Miami now. We have enough people now if we can get a regulation that will permit us to not spend our time being detectives.

I quite agree with what you are saying. It is the airplane and the people involved that is the first requirement. We feel that way very strongly.

Mr. BURTON. Now you act like you have to get the regulation published by some foreign body. You make the regulations, right? I

know you have to go through the rulemaking process, but you are the ones that make the regulations. So, all you have to do is have the determination to make it and the fortitude to push ahead even though some of the operators are going to say it constitutes a hardship for them.

Mr. SWATEK. We don't make the regulations in the region, but that has not held us up from going after the operational aspect of it. We have had thousands of ramp checks with the transport unit since April 1977. They have had 790 ramp checks and they have checked the credentials of some 900 airmen. They have issued 150 aircraft notices. Those all had to do with the operational things. We have gone after that. We have not ignored the legal economic part. That is what people have suggested to us. I say that is not true.

We do them together. If we can only do one thing at a time, we go in the quest of saving lives.

Mr. BURTON. Give me an example of an illegal lease. What is an illegal lease?

Mr. SWATEK. Well, as they said this morning, Mr. Chairman, it is so fuzzy. That is what is so frustrating about getting it. If I am a farmer in Florida and I want my cattle hauled to Venezuela, I can lease an airplane to haul my goods. That is legal. It gets illegal if the same person supplies the crew as well.

That is the cutoff point. They say, "He is actually in the transportation business because he has an airplane and crew." However, if I got the crew from somewhere else, then it is legal.

We had a case of one operation where they had a 727. It was the same office. One group had had the name JFC all set up. They had another group in the same office complex and they were a different corporation. It is true that they were all friends. They were all airline pilots on leave who would fly the 727. Is that legal or isn't it? That was the problem.

Mr. BURTON. No, if you come up with an adequate set of regulations it wouldn't matter what type of lease they had.

Mr. SWATEK. That is right. If we can treat all the airplanes the same——

Mr. BURTON. You have the authority to do it. All you have to have is the will to do it.

Mr. SWATEK. That is what the Administrator is proposing. All I can say is "hallelujah."

Mr. BURTON. Yes.

Do you have the authority? The GAO pointed out that there was an unsafe plane. FAA knew it, and told the pilot not to take the plane off the runway. He departed nevertheless. Do you have the authority to prevent a patently unsafe plane from taking off?

Mr. SWATEK. Mr. Chairman, I guess our legal people are still struggling with that. It has not in the past kept us from going aboard most of them.

Mr. BURTON. They told the pilot, "Don't take off. It is unsafe." The pilot took off.

Mr. SWATEK. Right now, the way I understand it, it is not authorized to do that.

Mr. BURTON. To do what?

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Mr. SWATEK. To force our way onto the airplane.

Mr. BURTON. I don't care about pushing your way on. You found the defect and said, "Don't fly" and the pilot flew.

Mr. HOWE. Mr. Chairman, as the Administrator has mentioned in his prepared remarks, our authority is entirely civil in nature. We have no authority to physically restrain, detain, or arrest an operator. If we have a deliberate, intentional violation of the regulations, such as the type you are talking about where clearly the airplane is in an unsafe condition. and clearly we have advised the operator of that—as Mr. Swatek indicated, many of his perhaps ingenious inspectors have resorted to bluffs to try to physically stop the aircraft—but in the final analysis and in the absence of any authority to arrest or detain the aircraft, there is no way and no authority by this agency to stop or restrain the aircraft.

Mr. BURTON. Can't you pass a regulation that says that a patently unairworthy plane cannot take off?

Mr. HOWE. We have such a regulation now. To enforce that regulation we have a variety of remedies. They are all civil remedies. They all involve either the obtaining of civil process, a temporary restraining order, or a civil seizure of the aircraft, and all of these involve operating through the U.S. attorney's office.

Mr. BURTON. Can't you set up by regulation a procedure whereby they won't be cleared for takeoff?

Mr. HOWE. There is no way we can deny a takeoff clearance under our existing regulations.

Mr. BURTON. I know that. I am asking whether you can pass a regulation to do it?

Mr. HOWE. Mr. Chairman, we could pass such a regulation but if they would not heed the order of the inspector standing on the ramp, there is little to——

Mr. BURTON. I am talking about the person who clears them for takeoff.

Mr. HOWE. I appreciate that, sir. But if they would not heed the order of the inspector, we don't believe they would heed the order of the air traffic controller in the tower any more. That is the type of operator we are concerned with and that is the reason for the proposed criminal legislation.

Mr. BURTON. In other words, you figure that a pilot so dumb to fly an unsafe airplane would take off from an airport without a clearance.

Mr. HOWE. Exactly, sir.

Mr. Swatek has an example of that that took place at the Miami airport.

Mr. BURTON. He has an example of a pilot who flew an unsafe plane, but he didn't have an example of a pilot who took off without a clearance.

Mr. HOWE. There was a case awhile ago at the Miami airport where that happened. The tower instructed the pilot to return to the ramp and he did not do so. He departed.

Mr. BURTON. I still think that having the regulation at least gives you some kind of leverage. You certainly do not have time to get the court to act.

Mr. HOWE. Mr. Chairman, we recognize that. As Mr. Bond indicated in his statement, we are considering including in our upgraded part 91

provisions similar to those we have in 121 to allow access to the cockpit for en route inspections.

One of the constraints that we presently are looking at is there is a recent Supreme Court decision that casts some doubt on the ability of agencies, such as ours, to conduct random——

Mr. BURTON. Are you talking about the OSHA case?

Mr. HOWE. Yes, sir.

Mr. BURTON. Do you people look for reasons why you cannot do something where safety is involved? The OSHA case was fairly limited in its scope. It did not go as far as everyone thought it should. It also had a point for probable cause.

Mr. HOWE. It is our agency's opinion that we have sufficient authority under the *Barlow* v. *Marshall* case. However, because of the fourth amendment issue that has been raised, before we promulgate civil regulations, we feel that we need to discuss this with the Department of Justice. It is a recent case, and we are considering this in our present upgrade of part 91.

Mr. BURTON. When you have reasonable probable cause of something—the OSHA case took that into consideration, as I recall.

Even if you have an inspection it doesn't do you all that much good, given the example where you find that an aircraft is unairworthy and——

Mr. HOWE. That is exactly right, Mr. Chairman. Even if we had the authority to do those things under the civil process without any criminal process to pursue the willful or deliberate offender, it is not going to stop that type of operation.

Mr. BURTON. I haven't had a chance to look at the legislation. When you get involved in penal legislation it can become cumbersome. You might be able to get the same authority as a fish and game warden who finds someone with seven ducks. I am serious.

I think if you try to get legislation through to put you on a par with the FBI, it will be a long time coming. But I think we allow fish and game wardens, and certain other people, to stop some person right now by removing them from the plane, for example.

It seems to be an inconceivable situation and one that seems to have gone on for an awfully long time.

Regarding the surveillance techniques of the transport unit, do you have a program of random inspection to insure that the programs required under FAR 91.217 are being fully implemented?

Mr. SWATEK. Yes, sir. That is what they do. Is the emphasis on random?

Mr. BURTON. Yes.

Mr. SWATEK. Yes; they spend their days on the ramp. There and also at Hollywood-Fort Lauderdale.

Mr. BURTON. You have a random inspection of the weight and balance cargo calculations? Do you see that that has been properly calculated?

Mr. SWATEK. When they do that, they do the whole thing. They look at the cargo. As I said before, we have very seldom had difficulty in coming aboard although our inspectors are not allowed to go aboard unless they are with the owners.

Mr. BURTON. I guess the long and short of it is that you had better change your regulations or you can't do a thing about this.

Mr. SWATEK. As I indicated, I certainly support that.

Mr. BURTON. You are doing the best you can, but you could find a drunken pilot with an overloaded plane with no brakes and a failing engine, and you cannot stop him from taking off.

I think that whoever it was, should have tried to implement that Smith report to the greatest extent possible rather than give in to pressure and implement it to a lesser degree.

I will state that is not because of your unwillingness to do it, but that under your present regulations, you seem unable to do it.

Do you still use designated pilot proficiency examiners?

Mr. SWATEK. Yes, sir.

May I say in connection with that that when we established the transport unit in April of 1977, we revoked all of the designations—every one of them—and said: "Let's do it again and recycle the whole thing." About half of them dropped out.

Mr. BURTON. That tells us something.

What kind of authority do those people have and what kind of checks do you put on them?

Mr. SWATEK. On our inspectors?

Mr. BURTON. No. On the designated pilot proficiency examiners.

Mr. SWATEK. As was described this morning, they may have nothing more than a private pilot's license, but they have to have a certificate when we look at their credentials—I mentioned that the transport unit looked at the credentials of some 790 of them, or I guess it was 920 since April of 1977. They have the pilot in command responsibility that any pilot in command of any airplane has but nothing more in terms——

Mr. BURTON. How do you check your designated pilot proficiency examiners to see that they are doing all right? Did you just start doing that?

Mr. SWATEK. I think that in my time in the region this is the first time that they have all been rechecked. They are all flight checked. We fly with them, and we go through with them what their responsibilities to the Administrator are. But I don't know that we have a program.

Mr. BURTON. They are responsible for certifying that someone else is a competent pilot; is that right?

Mr. SWATEK. Yes.

Mr. BURTON. We had testimony today from GAO concerning a designated examiner who was a suspected "illegal" operator—where you almost had a disbarred attorney judging the competence and legal standards of other attorneys. Is that still a possibility or did he get caught?

Mr. SWATEK. It is still a possibility. I suppose anytime you have a designee system it is possible. I think that we have changed the atmosphere so much down there that I think it is unlikely. Still, the question is a good one and it is possible.

Mr. BURTON. Do you give them total freedom? Don't you perform some kind of spot check to see how they are doing?

Mr. SWATEK. To check the checker?

Mr. BURTON. Yes; because the checkers are guys you almost picked up off the street or off the runway.

Mr. SWATEK. Not quite. It is true that we have a community of some 17,000 pilots down there which is an incredible number.

We do not take anybody who just wishes to do it. We are as careful as we know how to be, and only have as many as we need. As a matter of fact, there is quite a competition for getting designation. They think that is a very valuable thing to have.

Mr. HOWE. Mr. Chairman, I might add one thing. The program for designating any kind of pilot examiner takes people with a great deal of experience. They are usually people who hold airline pilot certificates with a large amount of experience in the aircraft involved. They are checked by the local district office who are familiar with their qualifications, and they review the check rides that are given by these examiners. We try to make sure that they are among the most qualified pilots in the area.

Mr. BURTON. How could you have had a pilot examiner who may have been, or should have been, under revocation himself? Did he just slip through the cracks?

Mr. SWATEK. As I understand it, and I have never met him, this gentlemen is an oldtimer who had a very fine reputation up until lately.

In this business of the bandits and things, many of these people are really very fine people who operate legally a lot of the time. It is such a back and forth situation. Certainly if we knew somebody was violating our regulations, he would not be our designee.

It is true, in that sense, if, in fact, he is guilty—I don't know that he was, and I am not quite sure whom we are talking about—but it doesn't matter. It is still possible, and I would agree with your point on that.

Mr. BURTON. We aren't really talking about illegality. In other words, you could probably have the best pilot in the world smuggling drugs. If you have a good, safe drug-smuggling operation, that is not what we are looking at. We are talking about competency and safety regulations that are set up by your agency to be adhered to. I want to get away from the illegality aspect because that is just another problem and that has to be dealt with by law enforcement. We are talking about competency of the FAA and of people.

I wonder if you could supply for the record the qualifications necessary to be a designated pilot proficiency examiner and how often these qualifications have to be reviewed?

Mr. SWATEK. Yes, sir. I will.

Mr. BURTON. Without objection, the record will remain open at this point for the purpose of inserting the additional material referred to.

[The material follows:]

QUALIFICATIONS NECESSARY TO BE A
DESIGNATED PILOT PROFICIENCY EXAMINER

We are enclosing pages from the FAA Pilot Examiner's Manual concerning procedures we use to appoint Proficiency Pilot Examiners plus Paragraph 9 on pages 3 and 4 which explains circumstances under which we would cancel any examiner designation. Basically, a Proficiency Pilot Examiner is appointed by first determining that a need for one exists. When a need is established, likely candidates are asked to submit a qualifications record which gives, in detail, the candidate's aeronautical experience and background. He must be at least 21 years old and have a good reputation for honesty and dependability. He must hold either an airline transport pilot certificate or a commercial with instrument rating and a type rating for the airplane in which he will be designated. He must have at least 150 hours of instrument time, 50 of which must have been in actual instrument weather conditions. The designation is issued for 24 months and upon renewal all of the examiner's qualifications are reviewed, and a "spot check" may be conducted by an FAA inspector at any time.

9. CANCELLATION OF DESIGNATION.

a. Reasons for Cancellation.

(1) The need for an examiner's services has ceased to exist.

(2) Evidence of malpractice or fraudulent use of his designation, or any act which might reflect discredit upon the Federal Aviation Administration.

(3) Any tendency to require constant assistance and guidance in complying with procedures and implementing the required standards.

(4) The inability of the examiner to work harmoniously with personnel of the office under which he serves.

(5) A change in the FAA policy on the examiner program.

b. Cancellation Procedures. When the cancellation of an examiner's designation becomes necessary, notification will be in writing. In the event cancellation is based upon deficient performance, or on the actions of the examiner, the examiner will have the opportunity to discuss the problem with supervising inspectors or to formally answer any charges of malpractice or fraud. If cancellation is based upon a reason which does not reflect a deficiency or an action of the examiner, the cancellation will become effective upon receipt of written notice.

CHAPTER 12 - PROFICIENCY PILOT EXAMINERS. (PPE)

122. CONTENT. This chapter of the Manual provides instructions and procedures for Proficiency Pilot Examiners to serve pilots who apply for proficiency checks when required to act as PIC of aircraft requiring two or more pilots that are operated under other than Parts 121, 123, 127, 129, 133, and 137 of the FARs.

123. GENERAL. As a general guideline, proficiency pilot examiners for the conduct of PIC proficiency checks in aircraft and in simulators should be selected at locations which best serve the interests of industry and the agency.

124. SELECTION.

a. A candidate for designation as a PPE for aircraft, simulators or both should be selected by a general aviation operations inspector where the need for an examiner at a specific location is recognized. He should carefully consider the candidate's record as a pilot, his availability, and the attitude of his employer regarding his acceptance of this responsibility. Qualification records, FAA Form 8400-2, should be carefully reviewed to determine the best qualified person available.

b. A PPE may be designated to serve outside the United States, provided such designation will serve U. S. citizens abroad, and his activities can be properly supervised by an FAA office. Designated examiners must be citizens of the United States.

125. GENERAL REQUIREMENTS FOR DESIGNATION.

a. A good record as a pilot, and a good reputation in the industry and community for honesty and dependability.

b. Be willing to serve the public outside his own organization upon reasonable request by an applicant.

c. A minimum age of 21 years.

d. Hold either an airline transport pilot certificate or a commercial pilot certificate with instrument rating and for PPEs in aircraft, a type rating for the aircraft type authorized. Any time he is acting as a PPE in an aircraft, he must hold PIC privileges for the type aircraft authorized. PPEs AUTHORIZED IN SIMULATORS ONLY need not hold a current FAA medical certificate, but in the case of a turbojet simulator authorization, must hold a turbojet rating on his basic pilot certificate. This rating need not be in the same type aircraft that the simulator represents. PPEs authorized in simulators only, in the case of turboprop authorization, need not hold a turboprop-type rating.

126. EXPERIENCE REQUIREMENTS.

a. Proficiency Pilot Examiner - Airplane.

(1) 2,000 hours as PIC, including 100 hours as PIC in each type of aircraft for which authority is issued.

(2) 150 hours of instrument time, including at least 50 hours in actual instrument weather conditions.

b. Proficiency Pilot Examiner - Rotorcraft.

(1) 2,000 hours (PIC), including 100 hours PIC in each type of rotorcraft for which authority is issued.

(2) Except for authorizations for rotorcraft limited to VFR operations, 150 hours instrument time, including 50 hours in actual instrument weather conditions.

c. Proficiency Pilot Examiner - Simulator.

(1) 2,000 hours of PIC including 150 hours of instrument time.

(2) 200 hours of instructor time in the type simulator for which an authorization is issued.

127. EXCEPTIONS. A recommendation for the designation of a PPE who does not meet all of the requirements listed above shall be referred to the Chief of the Flight Standards Division of the region concerned for review and approval before any commitment is made or certificate of authority issued. Recommendations for the designation of examiners who do not meet all requirements should include statements of all special circumstances affecting the designation.

128. EXPIRATION OF DESIGNATION. A PPE designation expires 24 calendar months after the month of its issuance or renewal, but may be renewed at any time before its expiration.

129. APPLICATION FOR RENEWAL. It is the responsibility of the examiner to present his certificate for renewal prior to its expiration. The renewal procedure should include:

a. A current CERTIFICATE OF AUTHORITY, FAA Form 8430-9.

b. A record of all proficiency checks conducted since the issuance or last renewal of his designation, showing the name of the applicant, date and result of the test.

c. A personal interview with the inspector from whom renewal is requested. This interview may consist of attendance at a meeting conducted by the district office concerned to review examiner performance, standards, and procedures.

130. AUTHORIZATIONS AND DUTIES.

a. Pilot Proficiency Examiners are authorized to conduct proficiency checks required by FAR 61.58 appropriate to the Certificate of Authority held by the examiner.

b. A Pilot Proficiency Examiner is authorized to charge applicants reasonable fees for his services. The amount of the fee to be asked should be clearly understood before any application is accepted by the examiner.

c. Pilot Proficiency Examiners are authorized to endorse applicants' logbook or flight record to show successful completion of the proficiency check.

131. LIMITATIONS.

a. All proficiency checks shall be conducted in strict compliance with Advisory Circular 61-66.

b. A PPE shall not conduct a proficiency check in any aircraft for which he does not hold a category, class, and type rating. He shall not conduct a flight test in a multiengine airplane, turboprop, or turbojet aircraft other than the make and model for which he holds a certificate of authority.

c. A PPE's proficiency check activity is not limited to his normal base of operations.

d. Examiners holding Certificates of Authority with PILOT PROFICIENCY EXAMINER designations may only conduct tests for Pilot-in-Command proficiency checks, appropriate to the TYPE aircraft for which they are rated.

132. COMPLIANCE WITH REGULATIONS AND APPROVED PROCEDURES. All pilot proficiency checks must be conducted in compliance with applicable Federal Aviation Regulations and air traffic control procedures. The recommended clearing procedures and other good operating practices noted in the current AIRMAN'S INFORMATION MANUAL should be observed on all proficiency checks. Cockpit vigilance for other traffic is an important part of total pilot proficiency, and this fact should be emphasized to all applicants. The operating limitations of the aircraft involved must be observed at all times, and the procedures prescribed in the Approved Aircraft Flight Manual, or Operations Manual acceptable to the FAA, shall be used in all tests.

133. FLIGHT TEST COVERAGE. Part 61, effective November 1, 1974, introduces a new concept in pilot training and testing, designed to assure that pilots are competent in the basic airmanship necessary to conduct the piloting operations appropriate to their certificates. The proficiency check in airplanes required for each 24-month period must be accomplished in the TYPE airplane in which the pilot is to act as PIC. However, as indicated in AC 61-66, Maneuvers and Procedures, the PIC may elect to perform certain authorized maneuvers in a simulator or training device. In alternate 12-month periods in airplanes, the PIC has the option of performing all required maneuvers or procedures in simulators and training devices in lieu of in an airplane. Whether he chooses to use an airplane, simulator/training devices, or both, the required maneuvers/procedures are limited to those outlined in the schedule for the 12-month check. Provision for the use of simulators and training devices has been limited to proficiency checks in airplanes, since such devices having the demonstrated capability for determining pilot proficiency for other kinds of aircraft are not readily available. Therefore, the proficiency checks required for other kinds of aircraft must include those maneuvers and procedures specified for the issuance of an original TYPE rating in the aircraft used for each 12-month check.

*134. SPOT CHECKS.

a. A PPE may be checked for competency/proficiency at any such time a check is desirable. An inspector shall always respond immediately to an examiner's request for standardization or guidance in the performance of his duties, whether for simulators or aircraft.

b. A PPE "spot check" may consist of any of the following:

(1) The observation of pilot evaluation conducted by the examiner with the inspector riding in the aircraft or simulator.

(2) A proficiency check of the examiner in an aircraft or simulator.

c. If a "spot check" indicates an apparent deficiency in technique, standards, or judgment, the district office chief shall initiate immediate educational or remedial action. *

*135. RECORDING OF PROFICIENCY CHECKS. The examiner shall endorse the applicant's logbook or flight record to show successful completion of the check or portion thereof. The endorsement must contain the applicant's name, date, PPE designation number, type of aircraft or simulator, and any appropriate comments. *

136. CANCELLATION OF DESIGNATION. A designation may be canceled by an inspector as described in paragraph 9 of this handbook.

*137-139. RESERVED *

Mr. BUTTERWORTH. Not just the personnel qualifications.

Mr. SWATEK. I understand.

Mr. BURTON. Could you also provide us with a breakdown on the man-hour allocation of the transport unit spent on the following tasks: aircraft surveillance, inspection program approval, answering telephone inquiries, monitoring pilot proficiency examiners, processing enforcement actions, and arranging the removal of aircraft carcasses. If you need that in writing, we could put that in writing.

Mr. SWATEK. I will get that for Mr. Butterworth.

Mr. BURTON. Without objection, the record will remain open at this point for the purpose of inserting this additional information.

[The material follows:]

Man-hour allocations of the transport unit

	Man-hours
Aircraft surveillance	4,500
Inspection program approval	1,800
Answering telephone inquiries	1,600
Monitoring pilot proficiency examiners	180
Processing investigations and enforcement actions	3,640
Arranging the removal of aircraft carcasses	150

Mr. BURTON. They have aviation flags of convenience in this area as well.

Mr. SWATEK. Yes, sir.

Mr. BURTON. What do you feel you can do as far as enforcing safety regulations on flags of convenience?

Mr. SWATEK. It is clearly more complicated because you are in international affairs. We are certainly able, if we see an airplane that is unhealthy, to go to the pilot and discuss it with him. I am not entirely sure whether we are able to put an aircraft condition notice on it or not. We are able to go after them and ask them for us to see it.

Mr. HOWE. Mr. Chairman, I can give you a little information there. The answer to the last question is yes. If the aircraft is of U.S. registry, the inspector can and certainly does give an aircraft condition notice if it so warrants.

The problem of the foreign air carriers using U.S. registered aircraft is, as Mr. Swatek said, a complicated one. It does involve a lot of foreign policy considerations. We recognize that there is an anomaly that allows a U.S. operator, if he can arrange, as the GAO has suggested, with a foreign country, to apply to the Civil Aeronautics Board for a foreign air carrier permit or what is called in the trade, a 402 permit.

Once it is licensed by the Civil Aeronautics Board, because of the treaty constraints under the Chicago Convention, we are essentially——

Mr. BURTON. The Chicago Convention of which year?

Mr. HOWE. That is the ICAO Convention, the Chicago convention of 1947.

Mr. BURTON. We have run into this with the Coast Guard and the Coast Guard, to their credit, may have to deal with IMCO which is, I guess, as interesting as dealing with ICAO. They find the ability to do things with tankers registered under flags of convenience and foreign-vessels generally in our ports. We were even able to stop the

Concorde from coming in when we wanted to because of its noise levels.

I just don't understand why, if you are both under the Department of Transportation you can't establish regulations that would allow you to set a certain type of safety standards so that some dry-lease operator can't end up getting another dummy corporation down in the Bahamas to evade what minimal standards he had to comply with in the United States.

Mr. HOWE. As far as the U.S. aircraft that are operating under these 402 permits are concerned, the upgrade of 91(d) will eliminate many of those problems. Additionally, because the Civil Aeronautics Board is inextricably involved in this, we are presently working with the Civil Aeronautics Board in their amending their application and licensing procedures under 402 to require compliance with ICAO annex 6 and some additional airworthiness requirements that we believe and they believe are appropriate to this type of operation.

Mr. BURTON. You can go above ICAO standards; is that right?

Mr. HOWE. That is correct. Yes, sir.

Mr. BURTON. I hope you would.

I have one final question.

Is there any way to insure that the lessees involved are aware that they have assumed full operational responsibility to these lease operation aircraft?

Mr. HOWE. This, of course, was one of the original purposes of the so-called truth-in-lending proposal that Admiral Smith originally made and is presently in the regulations in section 91.54. The purpose of this was to require that the lessee at least sign a statement indicating that he understood that he was the legal operator. The difficulty is, of course, that many lessees may well sign such a statement without fully appreciating the implications of their responsibility.

Mr. BURTON. Could your regulations change it so that it is not a part of the entire lease agreement in small print, like in the back of a Hertz contract. Is it a separate part of their contract?

Mr. HOWE. Yes, it is. It is required to be in bold face type prominently displayed on the bottom of the lease. It is just above the signature portion.

Mr. BURTON. Mr. Evans?

Mr. EVANS. I have no questions at this time, Mr. Chairman.

Mr. BURTON. Mr. Walker?

Mr. WALKER. No questions.

Mr. BURTON. Mr. Butterworth?

Mr. BUTTERWORTH. Is it possible that there is already one way you can exert control over U.S.-registered aircraft used by foreign air carriers? I believe that FAR part 43 requires that the aircraft be maintained in its originally certified state of airworthiness. There is a general regulation somewhere.

Mr. HOWE. The regulations require that it be maintained in its original or properly altered state. That is in part 43.

Mr. BUTTERWORTH. That would apply to a 91(d) operator.

Mr. HOWE. Yes, it would.

Mr. BUTTERWORTH. I believe the Chicago Convention requires you by treaty to insure that the proper airworthiness state is maintained.

You have a good handle there to use where any of the bilateral treaties or 402 agreements are involved.

Mr. Howe. We do have a good handle but the only requirement that we can presently require that they maintain their airplane to is the basic part 43 or subpart (d) requirements. We cannot impose any of the additional requirements similar to those that are in 121 which, of course, are the ones that would achieve a higher level of safety.

Mr. Butterworth. What if some 121 requirements are the only way to insure that the original airworthiness state is maintained?

Mr. Howe. That is precisely one of the aspects of our upgraded subpart (d). That is to incorporate those requirements that we believe are really appropriate for the operation of these large aircraft.

Mr. Butterworth. What is going to happen if you get U.S. citizens or concerns reregistering their aircraft in Guatemala or a similar country?

Mr. Howe. If they are foreign registered aircraft then the only control is that they meet the minimal ICAO standards and that the Board in issuing a 402 permit assure that in making their fitness determinations that they at least meet the minimal ICAO standards. We have no jurisdiction over foreign registered aircraft.

Mr. Burton. You cannot go above an ICAO standard for planes that land and take off at American airports?

Mr. Howe. Not foreign registered aircraft. No, sir.

Mr. Burton. Are you prohibited by law?

Mr. Howe. Yes, by law.

Mr. Burton. Are you prohibited by law to give an equivalent standard, or are you stuck with ICAO?

Mr. Howe. We are prohibited both by our own statutes and by the bilateral airworthiness agreements that the United States and many other countries are parties to.

Mr. Burton. How low is the ICAO standard?

Mr. Howe. I can't speak in any detail but ICAO annex 6 is a standard that is not as tough as part 121 but is above that of 91(d). I can't answer it in any more precision than that.

Mr. Burton. Conceivably if CAB were to do this, there would be not as much as we want but at least a fairly significant upgrading; is that true?

Mr. Howe. That is true.

Mr. Burton. Do you know whether CAB looks favorably upon this?

Mr. Howe. Yes, we have indeed. CAB has been very, very cooperative in this area.

Mr. Burton. Thank you.

Mr. Butterworth?

Mr. Butterworth. In effect, this means you have some aircraft actually owned and leased from 91(d) operators that are used on a scheduled basis by a foreign air carrier or operator to fly passengers, United States or foreign, in and out of the United States.

Mr. Howe. We do have a few of those but there are not as many as you would think. There is not a large number.

Mr. Butterworth. So there is a few and as far as we know, they may have no flight time/duty time limitations?

Mr. Howe. That is true.

Mr. BUTTERWORTH. Then, as far as we are concerned, we don't have any way to make sure they do?

Mr. HOWE. Not as of today. That is correct.

Mr. BURTON. What will give that authority to us, the CAB amendment?

Mr. HOWE. Until the rest of the regulations are changed, the CAB amendment, we think, will provide a significant improvement, and when our subpart (d) is upgraded, we think that there will be an improvement even above the ICAO annex 6 requirements.

Mr. BURTON. How would you look upon legislation that gives you the same authority that the Coast Guard has over foreign vessels in American waters?

Mr. HOWE. I am not familiar with the authority that the Coast Guard has.

Mr. BURTON. They can stop them from sailing if they don't have competent crews. They can stop them from sailing if, for instance, they have open hoses that will leak oil into American waters. They can stop them from sailing if they don't have so many certified personnel, and things of this sort.

Mr. HOWE. We think that with the proposed legislation with respect to title VI that as far as the aircraft over whom we have jurisdiction that we will have all——

Mr. BURTON. We are trying to give you jurisdiction over aircraft that you don't have currently.

Mr. HOWE. I understand that, sir. I am simply not able to speak as to the foreign policy aspect of that.

Mr. BURTON. I guess the question should go to the Administrator.

How would you look upon legislation that would provide you with the same type of authority that the Coast Guard has. In the Coast Guard you've got IMCO. They have got their ICAO. They try to do the best they can through international conferences and standards. When they find that the well-being of the American citizens are at stake they can move unilaterally, notwithstanding the IMCO regulations, if it is in American waters.

Mr. BOND. Was that question addressed to me?

Mr. BURTON. You are the Administrator. You are in charge.

Mr. BOND. First of all, we do have a network of bilateral treaties that are in effect today.

Mr. BURTON. So does the Coast Guard.

Mr. BOND. Second, until we look at the legislation or consider the circumstances, I just can't comment. The administration will have to masticate this issue and decide what is best with everything in mind.

Mr. BURTON. Maybe that is something you could bring up with the Secretary of Transportation because you are under DOT and the Coast Guard is under DOT. The Coast Guard has the same type of problems and has found a willingness and a way when the well-being of the American people is at stake to do this. They are doing it when it involves environment and fish—not even human lives.

I don't know if there are more ICAO protocols than there are IMCO protocols, but I would think that the laws of the sea, and those conferences have been floating around before the airplanes.

Mr. BOND. That is correct, Mr. Chairman.

Again, I am not in a position to comment. However, there is this to be said. The bilateral agreements which provide for mutual respect of another country's license, free American carriers abroad from duplicative, and possibly harassing, inspections by other countries. Heaven knows we have many, many more of our aircraft operating abroad than there are foreigners operating here. So, we would face the possibility of retaliation and I don't know what other things.

Mr. BURTON. I view it as the same situation as the Coast Guard has. We could get retaliation there. As I could perceive it, it is a problem that we are going to have to address. These dry-lease operators beat the price because they have two dummy corporations now, one for the plane and one for the crew. If you upgrade 91(d), maybe they will have a third corporation to register the airplane overseas, and will get out from under everything. You would then have no hook on them except through the CAB amendment, I guess.

I do know that it can be a complicated thing. However, I remember at one time we were going to, with or without ICAO, go ahead with what we thought was the best MLS system, and then things got hung up. So I don't know what will happen if we get too involved in all those international treaties. One of them was made back in 1947, and it may well be a little irrelevant today. But we will discuss that with the Secretary, I guess, because there seems to be a similarity between the problems that the Coast Guard has with unilateral action and yours. They had a gentleman down in New Orleans who had enough guts to take unilateral action with what they called a "letter memorandum." He just started going aboard foreign-flag ships and wouldn't let them sail down the river and out the Port of New Orleans until they had a certificated crew aboard.

Ms. Halterman?

Ms. HALTERMAN. I have no questions, Mr. Chairman.

Mr. BURTON. Thank you very much.

Mr. Administrator, Mr. Butterworth will give you those questions on MLS in writing.

When can we look forward to those upgrades on the 91(d)?

Mr. BOND. We are anticipating a review and revision of the entire part 91, not only subpart (d), around January.

Mr. BURTON. Are you just going to start reviewing it or are you going to come out with it?

Mr. BOND. It will be a complete proposal.

Mr. BURTON. When will you get word from CAB as to when they might——

Mr. HOWE. Within the next couple of days. We have been discussing that. As a matter of fact, there is a procedure that has been informally worked out with the CAB, and they are presently going through their——

Mr. BURTON. They could save them and us the trouble of a hearing if they would expedite this.

Mr. HOWE. That is correct.

Mr. BURTON. Thank you very much.

Our next witness is Mr. Edward L. Thomas, assistant vice president of engineering, Air Transport Association of America.

STATEMENT OF EDWIN L. THOMAS, ASSISTANT VICE PRESIDENT, ENGINEERING, AIR TRANSPORT ASSOCIATION OF AMERICA; ACCOMPANIED BY WILLIAM M. RUSSELL, MANAGER, NAVIGATION AND LANDING SYSTEMS; WILLIAM T. HARDAKER, ASSISTANT VICE PRESIDENT, AIR NAVIGATION AND TRAFFIC CONTROL; AND FRANK C. WHITE, DIRECTOR, DATA PROCESSING AND AVIONICS

Mr. THOMAS. Thank you, Mr. Chairman.

You have my statement which I have presented for the record, I can read that statement or I can summarize it.

Mr. BURTON. We will make your entire prepared statement a part of the record. Perhaps you could summarize it and make some added comments on what you have heard today.

Mr. THOMAS. That will be fine.

Mr. BURTON. Without objection, the entire statement will be inserted into the record.

[See p. 523.]

Mr. THOMAS. The primary objective of the certification process and the rules and regulations it must follow is safety—safety of the traveling public, airline employees, and the general public.

I want to assure this committee that no one has a greater interest than the airlines in air transportation safety, and we appreciate the opportunity to discuss this matter with the committee.

We feel that the existing certification process is working well and that has contributed in a major way to the preeminence of U.S. aviation products all over the world.

We feel the process has produced the finest and the safest aircraft in the world.

We recognize that any procedure is subject to improvement. We have concern about tampering with the U.S. certification system in the manner which has been suggested and which, in our judgment, could add to the time and expense of certification with no improvement in safety.

That is a brief summary of my statement. I realize these are very brief comments and I would be happy to answer any questions or expand on these comments as you wish.

Mr. BURTON. Are you talking about tampering with the system and opening up the advisory circulars and the internal orders which the air space industry and FAA seem to think wouldn't be that much of a burden?

Mr. THOMAS. I was referring specifically, Mr. Chairman, to the open hearing process. Insofar as the advisory circulars and notices, we wouldn't have any difficulty with those proceeding through the normal rulemaking procedures. Other than the fact that it might extend the process of their development. However, this would not bother us in any great detail.

Mr. BURTON. What would bother you? To my knowledge, I think that is the only thing that anyone was suggesting. Everybody seemed to be against it and then when we talked about it they seemed to think it wouldn't be that much of a problem.

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What do you think would be a problem?

Mr. THOMAS. The open hearing process which has been suggested during the compliance phase of the certification process. This is as it has been suggested by the Air Line Pilots Association.

Mr. BURTON. I see.

Mr. THOMAS. I think my remarks for the record were addressing that particular point. The subject of advisory circulars and notices was something which came up subsequent to that.

Mr. BURTON. Is your main concern protecting trade secrets as well as possibly preventing some additional delay?

Mr. THOMAS. The trade secret problem is mainly a problem for the manufacturer. I can see that that can be a very significant problem.

Mr. BURTON. For you, it would be a potential time delay?

Mr. THOMAS. For the airlines it would be a potential time delay and with no improvement in safety that we can see.

Mr. BURTON. That might be open to dispute. As I understand from the AIA representatives, the certification process takes about 6 years. I think they said it took from 5 to 6 years.

Mr. THOMAS. Depending upon the size of the airplane and the size of the project, it takes from 3½ to 4 or 5 years for the process to be completed.

Mr. BURTON. Your problem is you find yourselves waiting for your new plane.

Mr. THOMAS. That is correct, sir.

Mr. BURTON. I was wondering how much of a time delay you envision would be involved—leaving the trade secret aspect out for a minute. As you stated, this is not part of your concern. How much of a time delay do you think would be involved in having this part of the certification process open for comment?

Mr. THOMAS. Mr. Chairman, of course that would depend upon how many hearings were held and how long these hearings took.

Mr. BURTON. In other words, that could be built into a total disaster or maybe a really livable framework. It would depend on whether it might be a 2-week period or extend on into another year.

Mr. THOMAS. Mr. Chairman, I am not sure that any additional hearings during the compliance determination phase are necessary. I have difficulty in seeing how that would lead to an improvement in safety which is the basis for the certification process. The delay part of it, of course, as I said before, would depend upon how many hearings were held.

Mr. BURTON. I don't know if you or your representatives were present the other day when the flight attendants were talking about jump seats. I don't know if they could have caught that in a rulemaking process or if they could have brought that to the attention of the manufacturer unless they either went to the manufacturer and asked to see what they were doing with jump seats or the manufacturer showed them as they were designing equipment.

In other words, I would think there would be something that could be added by, let's say United, by their pilots or their flight attendants, having some input, since these people have to work and live with the product. Their input could be valuable.

Mr. THOMAS. Mr. Chairman, as I indicated in my statement, I believe that avenue is already open to the pilots, the flight attendants,

the airlines, and to anyone during the compliance determination phase of the certification process. This is not a public hearing, per se, but there is an open door within the FAA, as far as I know, that you could make any input that you desire and that FAA has indicated they will consider.

Mr. BURTON. There is an input now. I can see where having the possibility of input could be beneficial and not as time consuming as going through another schedule of hearings.

Would you care to comment on the collision avoidance discussions that we have heard concerning active and passive BCAS systems?

Mr. THOMAS. Mr. Chairman, I am not prepared to do so. I am here to talk about the certification process. I do have with me, however, William T. Hardaker, assistant vice president of air navigation and traffic control, and William M. Russell, manager of aviation and data acquisition for ATA.

Mr. BURTON. I know you gentlemen have a great deal of knowledge and also have something at stake in improved safety. Do you have any comments you would like to make? Have you supported some of the concepts and do you think some are better than others? What are your feelings on it?

Mr. HARDAKER. Mr. Chairman, we appreciate the opportunity to join Mr. Thomas today and discuss something foremost in many of our minds following the very tragic accident in San Diego.

In additon to Mr. Russell, who heads up our flight systems integration committee and the avionic section of ATA, I am joined by Mr. White who has been deeply involved in collision avoidance activities since about 1956 or 1957 when the airlines took a strong interest in looking for a system that would give them additional protection beyond that they would have from the ground air traffic control system.

If you wish to get into detail, we are prepared to do some of that with you. However, I would like to make a general statement on the subject which I think might be of interest. We have been working closely with FAA and the other users to develop what we feel would be an operable and acceptable airborne independent collision avoidance system for a number of years. As you are aware, we did some work of our own to the tune of about $2 million back in 1968 and 1969. In 1971 we turned that system, then known as ACAS, over to the FAA for further development and investigation insofar as its interaction with the ground ATC system.

We believe that the current FAA program to develop a collision prevention system is proceeding in a right direction. It is too slow, regretfully, but it is proceeding. We strongly support its objective to provide an automated means of preventing collisions in medium and high density air space by what is known as the discrete address beacon system and the automatic traffic advisory and resolution service. That is the DABS–ATARS that was very well covered this morning by FAA. We believe it is essential that DABS–ATRS be developed and be expedited to the extent that is humanly possible.

The FAA recognizes, as we do, that a time frequency or any other presently developed airborne collision avoidance system, the ACAS type, is not the best solution since it would not provide protection

from aircraft not having special cooperating devices installed in their aircraft.

We also believe that there is a better solution and that better solution being an airborne CAS based upon the present ATC radar beacon system, as mentioned this morning. This is called BCAS.

The FAA developed active BCAS interrogating aircraft transponders, we believe, shows considerable promise and we are asking them to get along with it.

However, to assure acceptable performance with high performance aircraft, and I might say that this was an item that was not covered fully by FAA this morning, BCAS must have a discrete communication link between aircraft as well as a degree of control from the ground ATC system under certain operational and technical conditions in highly congested regions of air space. I might expand upon that just a bit.

What we are talking about here is not only the problem of interference by false alarms that you heard about this morning. You can also run up against a situation between two high performance aircraft where unless you have a discrete communication link between the two aircraft, you will find that one aircraft cannot outmaneuver the other aircraft if both should take the same avoidance maneuver and they turned or climbed into one another. There is just not time. The aircraft need to get complementary signals so that they would maneuver in opposite directions. To do this we need a discrete communication link. We believe that requirement can be satisfied by the DABS system when that finally gets on board.

Mr. BURTON. How do you feel about the passive BCAS system?

Mr. HARDAKER. We've got to learn more about the passive. We know why it is there, and we believe it would give us a more complete system, when combined with active. It would be a backup to the ground system. But there is a lot to be determined. What I would conclude from that standpoint is that there are some difficult technical questions facing the FAA in this regard and also the users when you look at what the requirements might be to be able to put that kind of system on board the aircraft. We definitely will probably have to go to dual antennas. Whether they will be satisfactory or not and whether they will be blacked out under certain conditions or have some other limitations will have to be determined.

We believe that the full BCAS is pushing the state of the art. But I am also confident that we have the best brains in the country on board and working on it. Hopefully, we can solve the problems.

We would like to see the FAA expedite their work in this area to the extent that they can. We feel that progress in this whole subject of collision avoidance should be limited only by the need for sound technical decisions. I think that is what came out, at least to me, this morning while listening to FAA. They are trying to get the sound technical decisions.

I believe that kind of sums up where we are. In brief, we are supporting the work that the FAA is doing and, hopefully they will speed it up.

Mr. BURTON. I have one question and then Mr. Walker has at least one.

What is the fallback if you have this active system that shuts off when you get in the high density areas?

Mr. HARDAKER. Your fallback is your present system, Mr. Chairman. The present system developed to the extent that it possibly can be.

Mr. BURTON. I guess this argues for trying to perfect the passive system as quickly as possible.

Mr. HARDAKER. Yes; and the DABS–ATARS. It is a better system than we have today.

Mr. BURTON. Thank you.

Mr. Walker?

Mr. WALKER. What is the date that you mentioned that you turned the ACAS system over to FAA for further development?

Mr. HARDAKER. It was in October 1971.

Mr. WALKER. October 1971. So they have really had that now for 7 years.

Mr. HARDAKER. Yes, sir. There have been quite a few developments since then. If you recall, another manufacturer was brought in and there was a decision by FAA, probably about 1974, that there was a less expensive and, they thought, a better system than the system we had turned over to them. But I might add there isn't a system as of today that will work in high density terminal areas and give us the maneuvers necessary for high performance aircraft and also to be able to operate without a high number of false alarms.

Mr. WALKER. What I am getting to is this. You established in 1971 that there was a feasible airborne collision avoidance system; is that right?

Mr. HARDAKER. To the extent that we could develop it—and I flew it and it worked. The interaction of that system with the ground air traffic control system and the false alarms when aircraft were in high density areas were problems needing answers. When I say false alarms those are not just perturbations in the system, they are actual contacts of airplanes that are not genuine imminent collisions. They may be aircraft that are parallel to you and no threat but you will be getting an alarm.

Mr. WALKER. What I was getting to was this. If 7 years you established feasibility, are you satisfied that based upon the fact that you did the original research and handed it over to FAA that they have moved as expeditiously as they could in terms of application of the technology that you turned over to them and their development of that technology?

Mr. HARDAKER. Mr. Walker, I think generally, yes. We have been working closely with them on this subject as have the Air Line Pilots Association. We have been on their backs. We are not bashful about telling them whether they are moving fast enough.

It has been slow because of the problems.

Mr. WALKER. Do you feel they have been expeditious in terms of taking the developments and the technology and getting them into a production phase so that as technological advances have gone forward those have been applied to the air transport industry? Do you think they have done an adequate job of that along the way?

Mr. HARDAKER. Yes; I believe they have.

Mr. WALKER. Could you give us some idea of what you see as a timetable for future developments based upon what you now know?

What kind of timetable do you think FAA should be able meet in terms of completing a total BCAS system?

Mr. HARDAKER. Before I heard FAA answer that question this morning, my people had told me it would be about a year to a year and a half before we could get the first copy of a BCAS on board an airline. That would be really pushing it. After that you could run into a long space of time to get them in sufficient quantities and installed in the fleet. We would certainly want the program pushed to the extent it could be.

Mr. WALKER. Mr. Chairman, could I return to the certification process?

Mr. BURTON. Certainly. Let me ask just two followups on ACAS, and then back to that.

Mr. WALKER. Certainly.

Mr. BURTON. You did that in 1971. ACAS was flight tested with a big media show, and it worked.

Mr. HARDAKER. Yes, sir. As a matter of fact, one airline let a contract to have them installed—Piedmont.

Mr. BURTON. I heard Mr. Bond say that it caused problems in high-density areas as you mentioned. However, if you get a blip or a false alarm and rely on the good old see-and-avoid method and look out the window and see that the plane is not coming at you but is going the same way, it at least gives you some place to look. This might be beneficial. However, you still run into a problem with the active system where you are either totally dependent on the ground and, the see-and-avoid concept because it is turned off in high-density areas. I am wondering why, if that was fairly good state of the art in 1971, they screwed around with it. Who was the manufacturer or contractor when you were working with it?

Mr. HARDAKER. It was McDonnell Douglas.

Mr. BURTON. You said they switched contractors in 1974. Who was that?

Mr. HARDAKER. I would want to check on the date but it was Minneapolis Honeywell.

Mr. BURTON. What are they known as now?

Mr. HARDAKER. RCA was also involved.

Mr. BURTON. I wonder why they switched?

Mr. HARDAKER. Between McDonell Douglas and Minneapolis Honeywell?

Mr. BURTON. You had put your own money in. You came up with something that had bugs but it was the most advanced state-of-the-art device at that time and in some ways as good as what we have scheduled now. Somehow in their own way they forgot about that and moved into a new area?

Mr. HARDAKER. I am going to let Mr. White answer that.

Mr. WHITE. Mr. Chairman, at the time we offered the time frequency system which, as Mr. Hardaker says, was primarily the development of McDonnell Douglas the situation was this. At the time we offered it to FAA two other manufacturers in very short order stepped up with concepts. These two manufacturers were RCA, who had the SECANT system, and Minneapolis Honeywell with the AVOIDS system. It took several years to get those two systems to

a point where they could be flight evaluated, but that was done at government expense. The flight evaluation then proceeded. The McDonnell-Douglas time frequency system, the RCA SECANT and the Minneapolis Honeywell AVOIDS—those three systems were all flight evaluated at government expense. It so happened that the threat logic, which is the logic within those systems, was the identical threat logic that was developed back at the time ATA offered the system to the FAA. So they all had the same threat logic.

The reason I am emphasizing this, Mr. Chairman, is that it is the same threat logic, which is the best that was then available and with minor modification it exists today, is the same threat logic that creates the "not wanted" alarms in the terminal area. That remains a problem today that we have all talked about and which we all recognize.

So the FAA, as it continued to look at ways of exchanging information from one aircraft to another, which the three systems offered, made a switch really from a ACAS that required special equipment in each aircraft to a beacon-based CAS which used the aircraft air traffic control radar beacon (ATCRBS) as its cooperating element.

Mr. BURTON. So it went from air to ground.

Mr. WHITE. No, sir. BCAS, Mr. Chairman, has interrogators in aircraft that interrogate the aircraft's ATCRBS beacon.

Mr. BURTON. In other words, between what they had in 1971 and what you have right now, there hasn't been much improvement.

Mr. WHITE. There has been a significant improvement, Mr. Chairman. Let me explain it this way.

I put an ACAS installation, a time frequency, a Minneapolis Honeywell AVOIDS, or an RCA SECANT in my aircraft. You put one in your aircraft. We are the only two aircraft protected. Now, if I put a BCAS in my aircraft, I am protected from every aircraft—some 35,000 aircraft in the United States that are ATCRBS equipped. There is a significant difference, Mr. Chairman.

Mr. BURTON. Would they not have been building—maybe I am paranoid about FAA and their procurement, which I think is fairly well founded. Based on what you did in 1971, if they had pushed ahead and perfected that, wouldn't we have been a lot better off?

Mr. WHITE. I do not believe so, Mr. Chairman. As I say again, the important thing is that the state of the art developed to a point where it appeared feasible to interrogate the aircraft ATCRBS transponder. That was definitely a breakthrough. I don't believe anyone would argue with the statement that at the time we offered the FAA the time frequency CAS that it was completely unreasonable to suggest at that time in 1971 that interrogating aircraft ATCRBS could be made to work. There has been a significant improvement in this state of the art and now it appears feasible, and as everyone has testified, Mr. Chairman, it still remains a very complex and tough problem to solve. But you get such a big step in being able to interrogate all of those ATCRBS-equipped aircraft. It seems to be a very worthy goal. It is almost within grasp, as we are indicating.

Thank you, Mr. Chairman.

Mr. BURTON. Thank you.

Ms. Halterman?

Ms. HALTERMAN. Mr. Walker had to leave, but he wanted to ask you about this for the record. ALPA has requested public hearings during the certification process. What is your comment as to whether or not there could be—I realize the process is ongoing—one public meeting, or as ALPA suggested, one, or two, or three meetings throughout the process?

Mr. THOMAS. During that part of the certification process, the compliance determination process—the rules and regulations have already been established, and now we are determining compliance with those rules and regulations. We are not developing new rules and regulations; we are only determining compliance with those regulations which is the basic responsibility of the FAA. It has been given to the FAA by statute. I just fail to see how one hearing, two hearings, three hearings—no matter how many hearings—would add anything to the information and the ability that FAA already has to determine compliance with the regulations which is their statutory responsibility.

Ms. HALTERMAN. That is all I have, Mr. Chairman.

Mr. BURTON. Thank you.

Mr. Butterworth?

Mr. BUTTERWORTH. Mr. Hardaker, earlier we introduced into the record a few letters you had signed and sent to the FAA requesting a specific study be canceled or modified in some way. Do you want to make some comments now or submit more for the record, or both?

Mr. HARDAKER. No; not now.

Mr. BUTTERWORTH. I don't have any specific questions to ask you. I thought you should have a chance to respond.

Mr. HARDAKER. If the committee is interested in further background on those letters—they are not complete, but I would be most happy to discuss them with you or the committee at a later time if you are interested in more background on how we got to where we were in the two letters that you have. Some of the attachments, I understand, are missing. They are quite voluminous. Very briefly, it boils down to the fact that for many years we worked very closely with FAA on their all-weather program. We feel we have a great interest. In this instance, after repeated letters, meetings, and agreements to add into their program items that we felt as a user of the system and the airlines' All-Weather Committee felt were necessary, they were giving us lipservice in that they were telling us they were going to incorporate these and we would see the final product later and they weren't there. They would say they were sorry and that they would get them on.

This went on for a period of about 4 years. You have two of the letters. It was in one of them that we said we wanted them to suspend what they were doing and that we wanted to coordinate with them on what they were planning to do. That would go for the Air Line Pilots Association as well as with us, especially on what was necessary—what we felt was necessary at the time.

Mr. BUTTERWORTH. Could we request the additional documents?

Mr. BURTON. We will do that.

Without objection, the record will remain open at this time for the purpose of inserting this additional material upon receipt.

[The material follows:]

Air Transport Association ata OF AMERICA

1709 New York Avenue, N.W.
Washington, D. C. 20006
Phone (202) 872-4000

November 3, 1978

Mr. Bruce Butterworth
Subcommittee on Government Activities and
Transportation Staff
United States House of Representatives
Rayburn Office Building
Washington, D. C. 20003

NOV 6
NOV 6 19

Dear Mr. Butterworth:

ATA testified on September 28, 1978, before the Subcommittee on Government Activities and Transportation. At that time it was indicated that ATA would provide the Subcommittee for inclusion in the record of testimony, a copy of the attachments to an ATA letter to Mr. David J. Sheftel, FAA, dated August 11, 1975 (previously entered in the record by the Chairman).

According to our notes, the first of these attachments was an August 20, 1974 letter to General Spencer S. Hunn, FAA, which also is already in the record; nevertheless, for completeness, I am including a copy of it as Attachment 1 to this letter. The second attachment to our August 11, 1975 letter was a letter dated June 24, 1974 to General Gustav E. Lundquist (retired), FAA; it is presented here as Attachment 2. The June 24, 1974 letter made reference to earlier comments on FAA activity (included here as Attachment 3) contained in a May 18, 1973 letter to Mr. David R. Israel. In addition, the August 20, 1974 letter (Attachment 1) refers to a meeting at FAA, during which we discussed yet another letter dated August 8, 1974, also addressed to General Hunn, which updated views on needed All Weather & Development programs; this is included as Attachment 4.

We hope that this material will help clarify the fact that the airlines have had a continuing and long term concern that FAA's R & D on all weather operations productively addresses those areas which would safely foster efficiency and operating capability in the real world of civil aviation. With regard to our August 11, 1975 comments on military simulation and testing, we have yet to see any conclusive evidence that the portion of the FAA all weather R & D program conducted under an interagency agreement with the military was useful and valid when considered from the civil aviation viewpoint.

Thank you for the opportunity to submit these additional comments.

Sincerely,

William M. Russell
Manager, Navigation & Data Acquisition

Air Transport Association

Attachment 1

ata OF AMERICA

1709 New York Avenue, N.W.
Washington, D. C. 20006
Phone (202)-872-4000

August 20, 1974

General Spencer S. Hunn, Director
Systems Research & Development, ARD-1
Federal Aviation Administration
2100 2nd Street, S.W.
Washington, D.C. 20590

Dear General Hunn:

We appreciated the opportunity to discuss the FAA proposed "all weather" E & D program with you and your staff a week ago last Friday. As a major user of improved "all weather" capability we believe it is particularly important that the views of the airlines are considered to assure a program which will have a direct relationship to the achievement of safety and efficiency increases in operations.

Thus, we are pleased that our views, as expressed in our August 8, 1974 letter on the R & D work needed in the all weather program area, and your views appear to be in consonance on the significant contractual efforts which need to be a part of the program. It is our understanding that the following was agreed:

1. The use of the USAF C-141 and FAA CV 880 aircraft in the data collection task is intended only as a "platform in space" to carry experimental systems, and that data from these flights will not be used to assess the overall civil all weather system except where it is shown to be typical of current airline operations.

2. Data collection using the FAA Boeing 727, operated by Flight Standards Service in actual Category III weather, will receive primary emphasis in the program.

3. An effort will be made by FAA using other aircraft typical of those in airline service with automatic landing systems to obtain data on overall systems performance in actual Category III weather.

4. During airline line operations of Category III capable aircraft in actual Category II & III weather, the FAA program will collect operational data on the overall systems performance (ground and airborne). The data may involve use of pilot questionnaires;

however, in exceptional cases the airlines will consider providing the flight data recorder data in order to provide additional information.

5. The Head-Up Display effort may use flight tests if and when it has been shown that flight tests are necessary or of potential scientific value - after a thorough analysis of the operational role, the disadvantages, the human physiological/psychological factors (and the existing body of knowledge) of such displays. (We would like to be consulted before flight tests are programmed.)

6. The Independent Landing Monitor effort will emphasize an analysis leading to understanding of the potential operational role (and risks) of such systems, and will thoroughly examine the feasibility of providing the necessary level of integrity to assure such systems will not interfere with the automatic flight control system.

7. Task IV, the study of available ground roll performance measurement techniques, such as coded runway lights and DME, does not need to be and will not be a major portion of the all weather effort.

8. An inertially-augmented approach coupler study, if included after determination that such work will provide new needed knowledge, should not imply that such a system might be a prerequisite for airline operations below 1200 feet RVR 100 feet DH using Category II ground facilities.

9. The fail-passive system automatic landing system task is not a part of the FAA R & D program, except as it may become necessary to assist Flight Standards Service flight operations.

Although agreement was not reached on moving a Category III ILS from NAFEC to an operational airport, we continue to believe that significant worthwhile operational experience could be gained if this were to be done. Accordingly, we continue to urge that you reexamine your requirement for two Category III ILS systems at NAFEC (particularly for the version which will be typical of only two operational facilities) in the expectation that you may arrive at the view that it will be to your advantage to move the facility to assist the collection of data on airline operations in actual Category III weather. If necessary, we suggest a temporary replacement be obtained from the production contract for Category II facilities, upgraded to Category III, (for the period necessary to accomplish an "in service change" to move the Runway 31 ILS to Runway 13 at NAFEC). Further, the Category III ILS presently on Runway 13 could be installed at a moderate density operational location, if necessary, in order to permit occasional tests of equipment improvements.

As agreed, we will expect to be informed when the redrafted preliminary work statement, expressing our joint views, is available.

Thank you again for your help in achieving an economical and meaningful all weather R & D program to address the most apparent remaining problem areas in all weather operations.

Sincerely,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

Attachment 2

Air Transport Association ata OF AMERICA

1709 New York Avenue, N.W.
Washington, D. C. 20006
Phone (202) 872-4000

June 24, 1974

General Gustav E. Lundquist (Retired)
Associate Administrator for Engineering & Development
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

Dear General Lundquist:

The FAA has recently issued a formal Request for Proposals (RFP) on engineering support for "Development of an All Weather Landing System" (RFP No. WA5 S-4-0288).

After years of coordination on the All Weather Program, we are concerned at the public issuance of a work statement in the RFP which, in our opinion, misinterprets the status of the program and which, we believe, could seriously jeopardize the progress made to date in all weather operations. Accordingly, it is strongly recommended that the FAA delete the Tasks from the RFP and take steps to fully coordinate this work.

In February 1973, we received a copy of FAA's Engineering and Development Program Plan - All Weather Landing, dated October 1972, in which comments were requested on the document for use in subsequent revisions. At that time, the airlines' All Weather Operations Committee reviewed the plan and commented that significant changes were needed; the Committee's detailed comments were transmitted to the Office of Systems Engineering Management. Although the Plan stated that the next revision was anticipated in mid-1973, we have received no further word from FAA regarding the Plan, or our comments. In response to an inquiry, we received a letter from the Systems Research and Development Service, dated March 19, 1974, which indicated that a RFP for engineering support would be issued to address "long standing controversial factors" and listed a number of general program areas (on which we had commented in the Plan).

Shortly thereafter, the RFP was issued. Instead of actually addressing the controversial factors needed before development of hardware, the RFP calls for numerous hardware installation programs and appears to ignore the major controversial factors. Because of this, and the wording of the Tasks, the proposed contract would, in effect, place the whole all weather program in jeopardy, and could result in a significant setback to the airlines' programs to utilize presently installed airborne equipment.

Accordingly, it is requested that the Tasks be formally deleted from the RFP, and that arrangements be made to obtain agreement within FAA and with the users prior to assigning any replacement Tasks. Further, we would appreciate any information you may have of the status of the airlines' All Weather Committee's comments on the E&D Program Plan - All Weather Landing, many of which covered the same points which are now problems with the proposed contract.

Sincerely,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

Attachment: Comments on RFP
WA5 S-4-0288

ATTACHMENT

COMMENTS ON RFP WA5 S-4-0288

Task II reads like a "wish list" on Heads Up Displays (HUD) and extends far beyond needed analysis into development and flight testing. Numerous heads up displays have been tested, but none have been operationally adopted because of basic questions yet to be answered. The airlines' All Weather Operations Committee stated on numerous occasions, that in order to be acceptable, work on such displays should include determination of the disadvantages of such displays, as well as advantages and means to overcome the disadvantages. Further, a full assessment is needed of the potential operational role considering those remaining disadvantages that cannot be overcome. Potentially, some flight testing may be required to further define the disadvantages, such as eye fixation and flicker questions, but it is totally inappropriate to consider spending more Government money on a flight test program of just another heads up display without first doing the needed assessment of the real problems. This assessment is not called for in Task II and, accordingly, the Task needs to be rewritten.

As written, Task III on Independent Landing Monitors also ignores the need for a comprehensive analysis considering disadvantages, as well as advantages. No mention is made of the basic issue of integrity of such a monitor. Although our Committee has urged that work be done on ILM's, they have placed appropriate qualifications on such work which the proposed contract ignores.

Task V, Inertially Augmented Approach Coupler, asks for development of airborne equipment which might permit use of "lower" category ground facilities in Category III operations. Conversely, we have indicated that FAA should look at the real need for, and adequacy of, each of the specifications for Category II and III ILS performance, and not to develop airborne equipment for equipments' sake. Thus, the proposed task is headed in the wrong direction. Further, the first sentence of the Objective of Task V states, "...to determine the feasibility of conducting Category III operations on Category I or II ground facilities...". For years an airline in France has conducted scheduled passenger operations using Category II ground facilities in Category III weather (with decision heights appropriate to the redundancy in the auto-pilot) without inertially augmented approach couplers. Yet, the statement of objectives, by its location under Task V, implies that this is something of the future to be accomplished only with inertially augmented approach couplers. We believe this is totally erroneous and contrary to programs of the FAA Office of Aviation Safety.

Task VI, Fail-Passive Automatic Landing Systems, is also misleading on this same point. NAFEC has already participated in a test program to determine the suitability of a fail-passive automatic landing system to

operate below Category II. By inclusion of Task VI in the proposed contract, the reader is mislead to believe that this is a major new effort. Further, it contains other erroneous statements such as, "...in the United States, no operator has been given credit for lower weather minima by use of..." a fail-passive automatic landing system. In fact, U. S. operators are authorized 1200 RVR in lieu of 1600 RVR minimums in Boeing 747 aircraft if they initiate the approach utilizing the standard fail-passive automatic landing system on that aircraft. In previous coordination on the question of Category III operations with fail-passive automatic landing systems, the airlines' All Weather Operations Committee suggested that D&D of FAA provide data-taking support for a Flight Standards certification program. At the present time, it appears that this has already been accomplished; accordingly, this Task should be deleted.

Further, the Category III data collection effort under Task I appears to be heavily diluted with irrelevant data (USAF C-141, CV-880, and NASA TCV Program B-737) rather than aimed at a productive assessment of real world civil system performance. (If the military have special requirements in this area, we suggest that they be included in a separate contract and clearly earmark the funding.) In any case, the Task needs to be rewritten to indicate what kinds of information are needed and what is its intended use. As it stands in the RFP, the Task does damage to the overall program by implying that far more remains to be done than is really required.

Our Committee has objected to the "purgatory" nature of Task IV, Ground Roll Performance Measurement System, implying another requirement which has not been mentioned to date in Category III documents, such as ICAO Annex 10, of FAA Advisory Circular 120-28A. Further, it erroneously makes the statement that "such a device is essential for safe Category III B operations." Not only has this not been determined, but, to our knowledge, such a device has not even been defined to date. The statement as a Task is entirely premature and should be retracted until such a time as a coordinated requirement may be developed.

Although Task VII is not primarily intended for air carrier use (some ATA Member Airlines do operate small aircraft), we suggest that further description is needed, together with some basic decisions, before a meaningful contract effort can result.

Attachment 3

Air Transport Association OF AMERICA

1709 New York Avenue, N.W.
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Phone (202) 872-4000

May 18, 1973

Mr. David R. Israel
Director
Office of Systems Engineering Management EM-1
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20590

Dear Dave:

We are pleased to have the opportunity to comment on your Engineering and Development Program Plan - All Weather Landing, dated October 1972.

We are pleased to note that a number of changes recommended by the airlines' All Weather Operations Committee have been accommodated in the October 1972 version. However, after review by the airlines' All Weather Operations Committee, we find that there are still some areas with which we cannot agree. For your consideration, we have outlined these areas in some detail in the attachment and hope that appropriate changes to the Program Plan can be made.

To resolve these issues, I believe it would be helpful if we could meet jointly with OSEM/SRDS people and with those Flight Standards Service and Airway Facilities Service personnel concerned and hopefully reach an understanding on a course of action. We look forward to hearing from you and if you agree to a joint meeting, we can work out a mutually acceptable date.

Again, thank you for the opportunity to comment.

Sincerely,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

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Airlines' All Weather Operations Committee

Comments on FAA

All Weather Landing Development Plan

Report No. FAA-ED-07-3

General

The Plan shows considerable improvement since the last draft Plan, and much improvement is evident especially in Section 2 entitled, "Development Plan." The Abstract and the Executive Summary are relatively good descriptions of the program. However, Section 1, "Introduction," sounds negative and contains misleading information, and errors of fact. It could well be deleted from the Plan. In any case, we believe Section 1 would need a thorough rewrite in order to avoid damaging the program through misleading the reader and to correct the errors.

Comments Covering Several Sections

Comment 1

Throughout the document there is much lecturing, where brief clear problem statements would be helpful. In a number of cases the work sounds more like an educational process, than an effort to solve defined problems for industry. The document seems to blow up a problem which has basically been solved to the level of one which remains a major challenge. In doing so it tends to obscure the relatively few important efforts which would be of value to the air transport industry. The Plan should be briefed down to encompass efforts, the reason for doing them, and expected specific results.

Comment 2

We are concerned that the Plan has excluded most ILS development work without concurrent coordination and publication of the ILS program plan. Although this deletion is consistent with previous ATA All Weather Operations Committee comments if the work is included in the ILS program, the recent suspension of most of the ILS improvement work due to funding restrictions, has apparently stopped or delayed some of the potentially most productive FAA work in the entire navigation field.

We are also concerned over the status of the effort to develop an economical modification to upgrade Category II ILS to Category III capability; little information is available from the FAA, but this project also appears to have been suspended. An ILS plan should be

prepared, and sufficient funding should be restored to accomplish the ILS improvement program, the recommended ILS cost reductions, and the modification to upgrade Category II facilities as soon as practicable, but no later than mid-1974.

Comment 3

We continue to object to the lengthy retention of a Category III ILS at NAFEC. As stated in our previous comments, we believe that this ILS, one of the first U. S. built Category III systems, should be moved to an operational airport as soon as initial testing is completed so that airlines can obtain operational experience with these new facilities. The All Weather Operations Committee has again reviewed airline requirements for help from FAA in all weather operations and have confirmed that we see no need for a Category III ILS for training and equipment evaluation, particularly at a time when there is a need for this facility at an operational airport. Another ILS can be installed for other training and equipment evaluation functions at NAFEC. Later, when a modification to upgrade Category II systems to Category III has been developed, there should be a sufficient number of facilities to permit a long-term installation at NAFEC if a real need can be demonstrated.

Regarding any other potential needs for the Category III ILS system, such as testing modified antenna systems, such work should be conducted on a Category II facility until full assurance is obtained that the modified system is capable of performing the basic function. Only after that has been determined, should a modification be considered to a Category III ILS facility.

Finally, we use this opportunity to express our concern over the lack of progress toward basic Category III certification of the ILS which had been programmed for April to June 1973. We see little progress, and this effort should be accelerated. When completed, the ILS should be moved to a major airport where experience can be obtained in airline scheduled operations.

Comments on Specific Paragraphs

Comment 4

Paragrph 1.2 should be changed to state that the related projects are primarily being conducted for requirements independent of the All Weather Program, and are not included in the funding of the All Weather Program.

Comment 5

Subsections 1.4 and 1.5 (including 1.4, 1.4.1, 1.4.2, 1.5, 1.5.1, 1.5.2, 1.5.3, and 1.5.4) should be deleted as they do not give a balanced view of the present operational status of all weather operations and mislead the reader to a number of erroneous conclusions including the view that more work is needed than is necessary.

Comment 6

Paragraph 1.6.1 should be amended to delete the second sentence which is erroneous and misleading. The last sentence of the second subparagraph should be deleted as it is erroneous and implies the need for more R&D than may be necessary. Paragraph 1.6.2 should be deleted entirely as it is not essential to the section and can be interpreted in a negative manner.

Comment 7

Paragraph 1.6.3 should state that the Category III ILS at NAFEC should be moved, after initial testing, to an airport where airlines can obtain experience during line operations (see Comment 3).

Comment 8

Paragraphs 1.6.4 and 1.6.5 describe the Microwave Landing System (MLS) now under development in a separate program. We fully support the need for development of a new standard landing guidance system based on the work of Radio Technical Commission for Aeronautics Special Committee 117. However, the material included in the Plan is excessive and could mislead the reader as to the role of the MLS in the All Weather Landing Program.

To reduce the possibility and to correct some misleading statements, we request that the material be shortened substantially by combining Paragraphs 1.6.4 and 1.6.5 and making the following deletions:

a) In the first subparagraph of the present 1.6.4 delete material starting with the 6th sentence ("These configurations will ...") through the end of the subparagraph ("...either the airborne or the ground equipment.")

b) In the NOTE in the second subparagraph of the present 1.6.4 delete the words "mean to" so that it reads "This does not imply that ..." Delete the 2nd sentence in the NOTE entirely.

c) In present Paragraph 1.6.5 delete the first three subparagraphs, retaining only the subparagraph beginning "Because the transition to MLS will necessarily be lengthy..."

Comment 9

Paragraphs 1.7.1 and 1.7.2 offer background on FAA's role in all weather landing. In order to be correct, and avoid misleading the reader, the first subparagraph should correctly quote the FAA act, as revised, stating "...to encourage and foster the development of civil aeronautics and air commerce ..." (Sec. 305)

As the Congressional material reported in the second and third

subparagraphs does not appear to have been enacted by Congress, and because it could mislead the reader, both the 2nd and 3rd subparagraphs should be deleted including all material between "The responsibilities which the Congress..." and "...airport design, economics, and reliability."

The fourth subparagraph of Paragraph 1.7.1 should be revised to show that the Operating Services have primary responsibility for the system, along with their relationship to R&D.

The composition of Paragraph 1.7.2 is largely misleading, implying a need for work in areas where none is required. Further, Section 2 describes the Program adequately without the material in 1.7.2. Therefore, all of Paragraph 1.7.2 should be deleted.

Comment 11

Paragraph 2.2.2 describes the effort in support of Category III ILS implementation. This paragraph comments on the feasibility of upgrading the new Category II ILS facilities to Category III. The airlines' All Weather Operations Committee has recommended that a project for upgrading these Category II facilities to Category III be included as a major item in the ILS program, not this program. The reference to this project is Paragraph 2.2.2 is ambiguous and should be clarified. The definition of this project should be complete and the R&D effort should be conducted in a timely manner so that results can be utilized in the FY-'74 F&E implementation program.

Comment 12

Paragraph 2.2.3 entitled, "Rollout Guidance for Category IIIb," describes a project totaling $800,000.00 over the next five years. This much money appears excessive for the magnitude of the problem, and it should be reduced significantly. Whether or not major wording changes in the text are needed as a result of the proposed changes in funding is not clear. However, one portion of the text describes efforts toward rollout guidance with MLS. We do not foresee any need for work in this area, as the redundancy requirements for rollout when used with MLS should be no more severe than with ILS; if there are any differences, such efforts should be undertaken under the MLS program.

In the second subparagraph the second sentence erroneously states that distance to go (DME) information is not available with ILS. This should be changed to indicate that ICAO Annex 10 provides for DME at ILS which is available for implementation in the U. S.

Comment 13

Paragraph 2.2.4, "Visual Guidance in Category III," the first paragraph, in order to be correct, should indicate that operations in Category III weather have commenced in France using a 50 ft. Decision Height.

The last two subparagraphs of Paragraph 2.2.4 appear to be looking for R&D work and may greatly increase the cost of this project. There is too much money in this project in relationship to the overall program; and it should be trimmed. Possibly as a result of these fiscal changes, the last two subparagraphs of 2.2.4 should be deleted.

Comment 14

Paragraph 2.2.5, "Low Visibility Simulation and Aircraft," the statement about use of the visual simulator for routine inspection of visual aids should be deleted, as no requirement has been established for this use. Further, if there were such a requirement, it should fall under the FAA's performance assurance programs rather than under Category III All Weather Operations.

Comment 15

Paragraph 2.2.6, "Independent Landing Monitor," the first paragraph should be reworded to avoid a potential negative impression regarding ILS guidance. In this section, the fourth subparagraph on on Page 20 purports to state an ATA request for FAA sponsoring development. The ATA All Weather Operations Committee requested work on seeing-through-fog devices to determine the technical feasibility on providing integrity and reliability comparable to the integrity of the basic system on landing the aircraft, and not development of a multiplicity of systems as implied in the Plan; the Committee certainly did not imply development of a nuclear ILS. This feasibility determination also should be included in the FAA project as well as in the reference to ATA's request.

Comment 16

Paragraph 2.2.7 entitled, "Category III Capability for Small Aircraft," describes an ambitious program for development of airborne equipment. The amount of funding suggested in Attachment B appears insufficient to cover the scope of the project described, and as a result the project appears to be an attempt to get a "foot in the door" for later, much larger fiscal requests. The funding in the Plan also appears excessive for the need. We suggest that this effort be reviewed with the determination made as to the real requirements and as to how much of the benefit could be obtained out of the project described under Paragraph 2.2.9 "Utility of Fail Passive Autoland Systems" which, although intended for airline type aircraft, should have some returns for general aviation. It appears that significant amounts of money could be saved in this area, and the benefits provided to the users at an earlier date.

Comment 17

Regarding Paragraph 2.2.9, "Utility of Fail Passive Autoland Systems," the effort appears to have a great potential for significant payoff for airline operations and should definitely be included in the program. It should be an assessment of requirements, and not

development of equipment. As such, the effort should be primarily a Flight Standards Service responsibility with assistance of R&D as needed, and any necessary tests with FAA's Boeing 727 should be conducted by Flight Standards Service.

Comment 18

Paragraph 2.2.10, "Provisional Category III Airport," the accumulation of reliability data on the entire complex operating as a system should be achieved at operational airports rather than NAFEC (see Comment 3). Work at NAFEC should be limited to testing individual systems, such as developing modifications necessary to upgrade the Category II system to Category III capability.

Comment 19

Paragraph 2.2.11, "Category III Test Aircraft," describes R&D use of aircraft for Category III testing. One subparagraph refers to establishment of a joint program with NASA. Our reaction to this is that if there is work to be done here that requires a test aircraft, FAA should do it, and that NASA should not be in this business except as a "job shop" for FAA. The material in the Plan should be revised, after coordination, to show what specific efforts are to be conducted by NASA, if any.

Regarding the other statements of requirements for FAA aircraft, we are not convinced that a new aircraft is required nor that it ever will be possible for FAA to always have the latest airline aircraft available for full time R&D use. For this reason, the use of the basic test bed in conjunction with selected programs in cooperation with airlines would appear to be more feasible than a continual attempt to procure the latest aircraft. Further, we do not believe that this program Plan should include reference to a document which is officially restricted. From what we understand, that document is inappropriate anyway; thus, the reference to the, "The Requirement for a Flight Test Vehicle to Support FAA All Weather Landing Technology Programs," November, 1971, should be deleted.

The subparagraph on use of the present FAA training Boeing 727 is supported as a restricted activity under the control of Flight Standards Service.

The first subparagraph on Page 26 refers to use of aircraft for a demonstration of autoland for small aircraft. If the program as described in Paragraph 2.2.7 is realigned, then this paragraph should also be realigned. If this program is to be carried out, the control characteristics of these aircraft should be assessed before a choice of aircraft is made in order to avoid a total waste of effort.

Comment 20

Paragraph 2.2.12 entitled, "Category III Experience and Data Collection," appears satisfactory.

Comment 21

Paragraph 2.2.13 entitled, "Advanced AWLS Technology," includes far too much money for this future system development. The method in which the project has been described eludes pinpointing the cause for the excessive funding. For this reason, these comments will be on specific items that may or may not relate to the funding.

At one point in the first paragraph of this section a reference is made to improved approach couplers in landing guidance systems, which would be less sensitive to guidance signal interference or distortion. No description is offered as to what this is nor why it is part of an FAA responsibility. Until it is further defined, such reference should be deleted. Further on in the paragraph a reference is made to improvements and logic for monitoring automatic systems with a view toward reducing cost and improving reliability; in general, private industry is more than able to look at cost benefit and to establish reliability and maintainability of airborne systems. If this investigation is to be undertaken, it should be on ground systems; however, we do not believe that any such ground developments need relate directly to Category III, but rather should be a part of the ILS program.

A third paragraph in this section describes efforts in head-up displays. If head-up displays are to be included in this program, emphasis should be placed on looking at the potential problem areas such as fixation on the symbols, flicker vertigo, obliteration of real world cues, delay in pilot refocusing on an instrument panel, potential for omitting scan of instrument panel if all information is not included on the display, and lastly, how much information should be included on the display.

Comment 22

Under Related Projects, the transmissometer effort (2.3.1.1) is described well, as far as it goes. It should also include the ability to measure RVR in smaller increments as well as to lower values. This should correct the present resolution of readout only every 200 feet, which is undesirable.

Comment 23

Paragraph 2.3.2 on Crash Rescue Guidance for Category IIIb should be revised to be for IIIc, and should have an appropriately lower priority.

Comment 24

Paragraph 2.3.5, "Taxi Guidance and Airport Traffic Control for Category IIIb," seems to refer to ASDE as being used for radar vectoring of aircraft on the ground even under Category IIIa conditions, whereas ASDE conventionally is used for determining where the aircraft are and providing traffic control information. The operational requirements for such radar vectoring have not been established and the entire section should be revised to eliminate the inference that this

is the use of ASDE. Further, the last paragraph on Page 31 should be amended because it implies that an improved radar is essential for Category .IIIa operations which has not been established. This paragraph implies that the present limitations of the radar and the controller's use of it will limit Category IIIa operations. This has not been shown and should not be stated in such a positive sense.

Comment 25

Paragraph 2.3.7 describes the MLS development program as a related program. We note that the basic ILS program has not been described as a related program, and see no reason to apply a different approach to the MLS. We recommend that this paragraph be deleted from this Plan so as to avoid any inference that MLS program costs might be charged to the All Weather Landing Program.

Attachment 4

Air Transport Association ata OF AMERICA

1709 New York Avenue, N.W.
Washington, D. C. 20006
Phone (202) 872-4000

August 8, 1974

Spencer S. Hunn, Director
Systems Research and Development Service
Federal Aviation Administration ARD-1
2200 2nd Streer, S.W.
Washington, D.C. 20590

Dear General Hunn:

We appreciate the opportunity to meet with you regarding the All Weather program.

Your letter of July 12, 1974 requested a description of our program requirements in the all weather area. As indicated in our July 19, 1972 letter to Mr. David R. Israel, our first concern in the all weather area is for a more vigorous ILS development program, to include improved antennas for problem sites, reliability improvements, a concerted effort to reduce the cost of ILS, and a modification to Texas Instruments Category II ILS facilities in order to upgrade them to Category III. We believe these ILS efforts are, in effect, the basic building blocks of the all weather program. The airline needs on the ILS effort continue as stated at that time.

Further, certain improvements are needed to facilitate Category IIIa and b all weather operations. These are identified in the attached updated airline view showing near term and long term R & D efforts, with description of other R & D needs in related areas.

We look forward to discussing the proposed systems support contract at our forthcoming meeting.

Sincerely,

William T. Hardaker
Assistant Vice President
Air Navigation/Traffic Control

Attachment: Airline Views on Necessary R & D in Support of All Weather Operations.

August 8, 1974

VIEWS OF THE AIRLINES' FLIGHT SYSTEMS INTEGREGATION COMMITTEE ON NEEDED RESEARCH AND DEVELOPMENT PROJECTS RELATING TO CATEGORY III ALL-WEATHER OPERATIONS (BEYOND BASIC ILS DEVELOPMENT NEEDED FOR ALL CATEGORIES OF OPERATIONS).

I. NEAR TERM R & D EFFORT

The basic near term effort should be that R & D necessary to support a catch-up effort to increase the number of Category III ground facilities available.

a. Initial Verification of U.S. Category III ILS

Tests to determine that the Texas Instruments ILS, including any monitoring functions, performs to the Category III Standards and Recommended Practices (SARPS) of ICAO Annex 10, Part 1. Volume 1, should be completed.

b. Reliability Testing and Commissioning of U.S. Category III ILS

The necessary reliability measurement and analysis should be completed for the Texas Instruments Category III ILS facilities to establish the suitability for commissioned Category III operational use. As the Texas Instruments Category III ILS facility was not initially installed at an operational airport, it should be moved to an operational airport and installed in operational condition as rapidly as possible, following completion of the reliability testing. The ground facilities should be commissioned Category IIIa as soon as practical.

c. Upgrading Category II ILS to Category III

(As described under the ATA proposed ILS program.)

II. THE LONGER TERM R & D EFFORT

The longer term effort is intended to advance Category IIIa operations and to aid in initiating Category IIIb operations.

a. Category IIIa and IIIb Operational Experience

The longer term Category III effort should concentrate on obtaining operational experience in actual and simulated Category IIIa and IIIb weather utilizing existing FAA aircraft under the direction of the appropriate FAA operating service, but with data of scientific quality gathered by E & D. Aircraft should be typical of airline aircraft in current service. The program will not necessarily require a fully certified Category III airborne system; rather the emphasis should be on evaluating the visual runway and taxi information available to the pilot, and the overall Category III environment.

b. Airline Operations Data Analysis and Investigation of Use of Fail-Passive and Fail-Operational Autoland Systems

The longer term Category III effort should include data gathering on the performance of operational airline Category IIIa airborne equipment in airline

operations with appropriate ground facilities. After coordination with concerned airlines, the test results should be made available to other interested groups. (The coordination is intended only to establish that the reports are factually complete, and that the conclusions and recommendations are substantiated.)

c. Category III Performance Assurance

A part of the longer term effort should be the development of improved performance assurance techniques for Category III ground facilities, both at the equipment and the signal-on-the-runway level. General performance assurance efforts on ILS are not included in this program.

d. Category III Weather Investigation

This program should include 1) an effort to measure the actual dynamic behavior of weather near and on the runway during real-life Category III conditions; and 2) an accelerated effort to assess available improved RVR transmissometers with the capability to measure much lower visibility values (down to 100 feet), to measure them more often, and to read out in finer increments (100 feet).

e. Category III Lighting

The operational utility of color coded runway centerline lights for distance information should be validated for use during Category III to determine runway remaining. The comparability of runway balanced centerline and edge lights as a basis for RVR measurement should be operationally evaluated in order to support the U.S. position to international standardization on this matter.

f. "Seeing-Through-Fog" Devices/"ILM" Investigation

The longer term program should include analysis on "seeing-through-fog" devices, such as airborne radar which is truly independent of other guidance and instrumentation in the aircraft, for use in assessment of ILS automatic landing system performance. The analysis should include development of a realistic statement of operational needs, if any, for "independent landing monitors" (ILM), and determination of the technical feasibility of providing integrity and reliability comparable to the integrity of the basic system landing the aircraft.

III. RELATED EFFORTS IN OTHER PROGRAMS

a. Physiological and Psychological Factors

FAA programs should include analysis of physiological/psychological factors and workload/monitoring aspects of pilots in the possible use of new and unique displays. Realistic statements of the potential roles of prospective new systems should be developed which consider inherent disadvantages as well as advantages. This effort should examine the data and displays needed by pilots to effectively monitor and control approaches in all types of flight conditions, and in operations along complex flight paths. The FAA program

should also include (primarily laboratory) investigations of basic physical limitations of pilots, through use of optometer, eye-movement and related studies, to establish a data base on human capability to "simultaneously" view the outside world and infinite focus displays, capability to see dim cues through light-impeding dichroic mirrors, head-up/head-down transition adaptability, data assimilation limits, etc. If necessary, flight tests should be conducted to determine significant specific physiological/psychological relationships (if not already established in prior work). FAA should work in partnership with NASA on this effort. This effort should not be included directly in the All Weather Program because its' potential use covers other areas of broader applicability.

b. Weather Modification Research and Development

The all weather program is related to the weather modification research and development program. The efforts are considered to be complementary, as Category III capability will permit operations in many types of visibility restrictions (for, snow, rain and possibly dust) while fog dispersal is of principal interest at airports where fog is the major restriction to visibility. All weather equipment, training and procedures also provide improved safety for routine operations in Category I through visual conditions.

Mr. BURTON. Thank you very much for your testimony. You will be excused. I have to go make a vote, and then we will come back and hear from Mr. McIntosh, the director of operational services of the National Business Aircraft Association.

If you gentlemen could think of any further information that might be helpful to us, talk to Mr. Butterworth with regard to what you could send in to us.

[Mr. Thomas' prepared statement follows:]

PREPARED STATEMENT OF EDWIN L. THOMAS, ASSISTANT VICE PRESIDENT, ENGINEERING, AIR TRANSPORT ASSOCIATION OF AMERICA

MR. CHAIRMAN:

My name is Edwin L. Thomas. I am Assistant Vice President, Engineering, of the Air Transport Association of America (ATA), which represents virtually all of the certificated scheduled airlines in the United States. I am accompanied by William T. Hardaker, Assistant Vice President, Air Navigation and Traffic Control and William M. Russell, Manager, Navigation and Data Acquisition. I appreciate the opportunity to appear before this Subcommittee to provide the views of the ATA member airlines on the important subject of the Federal Aviation Administration's (FAA) type certification process for transport category aircraft and aircraft components.

While the aircraft certification process is largely between the aircraft manufacturers and the FAA, the airlines have a large and obvious stake in its results, because the certification process is critical to the safety and integrity of the national air transportation system.

The primary objective of the certification process and the rules and regulations it must follow is safety -- safety of the traveling public, airline employees, and the general public. The United States has the most comprehensive certification process in the world, and its rules and regulations are adopted or emulated by many countries. This process has been developed

over a half century of practical experience and the result is the finest and safest aircraft in the world. In short, the United States is a recognized world leader in aircraft certification.

This leadership and the widely recognized integrity of the certification process in the United States have contributed in large measure to the fact that aircraft produced in this country are accepted the world over for their high quality and safety. Over 80% of the free world's jet transport aircraft are U. S. manufactured. We should be very proud of this accomplishment and of the certification process which has brought it about.

I do not intend to describe the certification process in detail, as this is more appropriately done by the FAA and the manufacturers. It should be sufficient to say that there are two principal phases in the process prior to the entry of a new aircraft type into service: (1) the development of the rules and regulations governing the certification process which is handled by the FAA, under normal rulemaking procedures in accordance with the Administrative Procedure Act; and (2) the steps by FAA to insure that the manufacturers have complied with the regulations.

The Rulemaking Phase

The FAA general rulemaking procedures are described in 14 CFR Part 11, which in itself is subject to those same rulemaking procedures.

During development of these rules and regulations, all interested parties are given an opportunity to express their views and comments. These may be in writing in response to published Notices of Proposed Rulemaking in the Federal Register, or during public meetings which are held by FAA. FAA has held numerous meetings which are open to the public, where the certification rules and regulations are discussed. The public is invited to submit proposals for consideration during these meetings and to participate in the discussion. FAA then determines which of the proposals should proceed to rulemaking where further opportunity for comment is provided. After consideration of all views and comments, FAA adopts what it considers the appropriate regulations, as they are charged to do by the Federal Aviation Act of 1958 as amended.

While we do not always agree with the final FAA determination, we consider we have an ample opportunity to make our views known. In addition, there is still opportunity to petition the FAA for further rulemaking if anyone deems this necessary. This is certainly an open and straightforward process.

The Compliance Phase

Subsequent to adoption of the certification rules and regulations, it is FAA's basic responsibility to insure that products certificated by FAA meet these requirements. Many of the FAA regulations and requirements

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are necessarily objective in nature and require the exercise of considerable judgment and expertise in determining compliance. In the exercise of this judgment, FAA utilizes qualified people outside the agency to take certain specific actions. These industry "designees" are held personally responsible to the FAA for the actions they take; the actions are certified by the designee and are subject to review. The FAA retains the final decision-making authority.

If the FAA were forced to abandon the use of the designees to assist in the thousands of actions and decisions required during this phase of certification, it would be necessary for the FAA to expand its staff by hiring hundreds of highly trained experts at great public expense. If these experts were available, which is doubtful, such an expanded staff would duplicate the work of the expert staff in the aviation manufacturing industry. The fine safety record of U. S. built aircraft proves the success of the existing system.

Despite the participatory procedure in the rulemaking phase of the certification process which I have described, there has been the suggestion that the compliance determination phase of the process is a "closed" activity and that interested parties have no way of injecting their views. We cannot agree. For example, it is our understanding that the FAA has invited written suggestion and comment to the Aircraft Type Certification Board, and assurance has been given that it will receive full consideration. We believe this avenue is open to pilots and all other interested parties.

The release of certification data to the public is governed by existing law. Proprietary information is protected from release -- as it should be; the Freedom of Information Act makes most other information available. Insofar as public hearings are concerned, the Federal Aviation Act of 1958 empowers the Administrator to hold them. If interested parties were to present the Administrator with reasonable justification showing that a public hearing on a certification matter would be in the public interest, the Administrator would surely be responsive, as he has been in the past.

There is nothing which prevents any party with a legitimate interest from providing its inputs to the certification process. Any further "opening" of this process would not measurably contribute to maintenance or improvement of the high level of safety achieved under the present procedure. It could on the other hand, contribute measurably to delay and unnecessary expense of a process which, by its nature, is time-consuming and expensive, an appropriate indicator of the careful attention and scrutiny given before a product is certificated by FAA. If any interested party could demand and receive public hearings at any juncture in the compliance phase of the certification process, different people or organizations would have different opinions as to what aspects of the certification of a given aircraft should be the subject of public hearings. The result could be a never-ending process of public hearings, but even that would not change the fact that, in the end, FAA must make the final judgment. In chartering the FAA, Congress very

carefully determined that it wanted no ambiguity in federal responsibility for aviation safety. Accordingly it fixed that responsibility by statute in the Federal Aviation Administrator. It should be a matter of concern that a continuous process of public hearings could create such a confusion of views about certification as to denigrate the responsibility of the FAA Administrator for the reliability of American-made aircraft.

The time from initial order to delivery of a newly designed aircraft to an airline is approximately four years. In addition to committing hundreds of millions of dollars to the purchase of a new aircraft type, airlines must plan for its introduction into operation. Delays in certification would increase the uncertainty of aircraft delivery dates and could have a serious adverse effect on the airlines. This would be a particularly serious problem at the present time with a number of new U. S. aircraft certification programs beginning.

Conclusion

In summary, we feel that the existing certification process is working well and that it has contributed in a major way to the preeminence of U. S. aviation products all over the world. We recognize that any procedure is subject to improvement, but we have concern about tampering with the U. S. certification system in a manner which, in our judgment, could add to the

time and expense of certification with no measurable improvement in safety. It could have an adverse effect on the U. S. aviation industry and on the effectiveness of the process itself.

Finally, I want to assure this Committee that no one has a greater interest than the airlines in air transportation safety and we appreciate the opportunity to discuss the matter with the Committee.

Thank you for the cpportunity to make this brief statement. I will be happy to answer any questions by the Subcommittee.

[Recess taken.]

Mr. BURTON. The hearing will be in order.

Our next witness will be Mr. Fred B. McIntosh, director of operational services of the National Business Aircraft Association.

STATEMENT OF FREDERICK B. McINTOSH, DIRECTOR, OPERATIONAL SERVICES, THE NATIONAL BUSINESS AIRCRAFT ASSOCIATION

Mr. MCINTOSH. Thank you, Mr. Chairman.

It has been our pleasure to work with the GAO in their investigations. Quite honestly, after those meetings we thought since the issue was relatively clear, one of commercial versus private operations and one of proper enforcement by the FAA, that we would simply file a short statement with you and not appear formally.

In view of our testimony today, the questions of the subcommittee, and the answers given, I am very pleased that I am here and able to speak with you directly because I feel very strongly that there has been some information entered into the record today that, if not outright erroneous, will be misleading to those who read your committee's report, findings, and recommendations.

As an example, Mr. Chairman, the Admiral Smith report, officially the Assistant Secretary for Safety and Consumer Affairs, has been much quoted today as the bible for FAR 91(d), and the opening statement says, "To conduct an in-depth investigation of charter operations utilizing large airplanes." It goes on later in the same paragraph, "to encompass the present regulatory policies and practices, the adequacy of current law and regulation, as well as the methods and resources for their enforcement. In addition, the activities peripheral to their commercial"—I stress again "commercial"—"large airplanes."

Mr. Chairman, you will note that today's hearings have gone wide afield, and subpart (d) has been held responsible by many witnesses, and some of the questions from the committee would indicate that the committee members also believe this as being inadequate.

One particular statement bothers us very much. That is, the level of safety of operation of the aircraft and crew under subpart (d) is less than it is under 121.

May I point out to you, respectfully, that the conditions are entirely different. The aircraft is maintained at the same standards. It is inspected to the same standards. The crews meet the same standards.

In air carrier service you have large fleets. It is entirely possible that the crew may not have not met prior to arriving at the operations room to go on a flight. They would be on a different airplane on every flight. The maintenance would be handled by strangers—personnel completely strange to them. Training is handled on a standardization mass production basis. This is not meant in criticism of our friends of the airlines. It must be that way to run an airline.

In private operations it is completely different. It is not unusual for the same crewmembers to fly together for 10 or 20 years. The aircraft is maintained in the same hangar day after day, and night

after night, and it is the same aircraft. The training is done professionally.

The concept of the pilot proficiency examiner which has come in for some deprecation in Cockroach Corner—the FAA is the first to admit they do not have personnel with which to check ride with every pilot. I would only point out to you that without the PPE's capability in subpart (d) of 91 operations, it would be chaos.

The airlines fly with their own personnel. They have their own PPE's, so it is not something different. I can back this up very simply with a statement of safety statistics. The group that we are talking about, Miami, Houston, Columbus, Cockroach Corner, constitutes to the best of our knowledge, less than 3 percent of the aircraft operated under subpart (d). If this is true, and the comments made by some witnesses, including the counsel from the Southern region, that they intend to upgrade rules that are not now enforced, I submit to you, Mr. Chairman, that the tail is wagging the dog.

There is a responsible industry carried on under part 91 and to change the rules and update them on the basis of a handful of people that the FAA know and can identify and can take action with, seems to us not appropriate in any manner or means.

I will not go into my prepared statement. It is late. I will discuss only those aspects of leasing. I gather from testimony here today that the ability to lease aircraft seemingly is held to be different than it is to lease a bus or a truck. I am hoping when you have read our testimony, our reference to a shoe company, naming it the Burton Shoe Co., will bring the point home.

The leasing of aircraft is quite common. Banks, financial institutions and others, for economic and fiscal reasons own the airplane. But they are operated in a vast majority under subpart (d) as being within the safety limitations as required not only by Federal law but moral law.

You might be interested to know that the air carriers have the legal capability of operating under subpart (d) if they so desire when they are not carrying revenue passengers.

I would stress to you the safety figures over a 5-year period in the turbojet area alone that subpart (d) operations equalled or, in some cases, excelled certificated air carriers on the basis of hull for hull in accident statistics.

I do not believe that going through our prepared statement in detail would contribute much more at this particular time, and I would be more than happy to answer any questions that you might have on the private operation of aircraft under subpart (d) and other appropriate regulations.

Mr. BURTON. Without objection, your entire statement will be inserted into the record.

[See p. 539.]

Mr. BURTON. Your basic feeling is that the regulations are OK but enforcement is inadequate?

Mr. MCINTOSH. That is correct, sir. We have been as concerned with the operations in Miami as much as our friends in the FAA have for a number of years. I have personally visited there several times and will be there again next week.

We believe that the FAA has the equipment and the material but they may or may not have the personnel. We were aware of the special office created, but I was not aware that they had assigned as many as they had to that office. We think they have the tools, and we think if they need more help that perhaps your committee would give some evidence of assisting them in getting that help.

Mr. BURTON. GAO's testimony indicates—correct me if this is not exact or if you do not believe it to be exact—the difference between 121 regulations and 91(d) involves more than the standards. Under 121, FAA has greater enforcement tools. Under 91(d) they need permission to enter an aircraft to check it for airworthiness. Weight and balance calculations that are required under 121 on paper are not required under 91(d). They can take greater action on commercial operations under 121 than they can under the so-called private commerce in 91(d).

Mr. MCINTOSH. There are four questions there. Let me take them one at a time.

Frankly, I was a little amazed to find out that the FAA felt that they legally thought that they could not enter an aircraft. It is not uncommon for an FAA inspector to come and examine an aircraft, ask to go aboard, make a routine check and, for that matter, even fly in the airplane in the business fleet. It may or may not in a legal sense—if someone put up an argument. That is something I was not aware of. That is something we have always accepted in our portion of the fleet as being not only proper but necessary.

The question has been raised about maintenance. The term "continuous maintenance" was mentioned. You cannot mention either maintenance or inspection, Mr. Chairman, without talking to them collectively. In an airline maintenance program or any continuous maintenance program, it infers and must contain an inspection program. You can wear out an airplane by taking it apart prematurely. So you inspect it on a schedule. In the air carriers who operate on a schedule basis this can be spelled out by hours, dates, times, et cetera. Since the mechanics doing it differ from one shift to another, then the mechanics or the bookkeeping that go with it are such that you are working to a bookkeeping and data processing system.

In the corporate fleet you accomplish the same thing a different way. You have a continuous inspection program with requirements for maintenance either on "as required" or "as per manufacturer's recommendations." We do not schedule our flights in the manner in which the air carrier does, as you well know, and to work with what we call "hard times" would be physically impossible. But this in no way means that either aircraft is in a less mechanical or safe condition than the other. They both are equal and the statistics prove it. It is the environment, the human environment and the service environment, in which they work.

The same thing is true of pilots. We are required to check type ratings once a year. We currently have what the FAA requested for an exemption to permit this to be changed on a continuous basis because we have never believed that proving to God and one other person you can fly an airplane once a year is quite sufficient. You should be able to train, practice, and get credit for it and be encouraged to do so throughout the year.

I do not see other major differences between 121 and 91 in the phase that you were talking about. Our inspection programs are all approved by the FAA. They are open for inspection. We keep records. The records themselves are open to the FAA. NBAA, I am proud to say, went a long ways in working with the Federal Government in developing those programs so they would be equitable to air carrier service.

Mr. BURTON. If you own an airplane and you do not lease it, and you have your own crew that flies the airplane transporting shoes, you have to meet a certain standard; is that right?

Mr. MCINTOSH. That is correct.

Mr. BURTON. Which standard is that?

Mr. MCINTOSH. If it is a turbojet aircraft or an aircraft weighing more than 12,500 pounds it will be part 91(d).

Mr. BURTON. If I own the plane, own my own crew, and fly my own cargo?

Mr. MCINTOSH. That is correct. It is a private operation.

Mr. BURTON. What happens if I lease the plane, lease the crew, and fly my shoes?

Mr. MCINTOSH. Under the existing law, that also can be accomplished under part 91; however, you must understand that by affixing your signature to the truth-in-leasing segment required under FAR 91.54, you are assuming the responsibility for that operation and with all that goes with it.

We, as an association, discourage that type of operation. We believe it is improper and unsafe.

Mr. BURTON. So 91(d) can apply but does not necessarily apply to that?

Mr. MCINTOSH. That is correct.

Mr. BURTON. That is the point we are trying to make. We are trying to get at those who avoid or can avoid the standards on 91(d) by going through the dry lease operation or the kind of conduct you didn't agree with, whereas really the Burton Shoe Co. leases a plane, and the Burton Boot Co. has the pilots. In that way. I am flying them down to a dancing contest in Mexico where they are really customers of a a hotel down there and in this case there is really hardly any safeguard that applies.

Mr. MCINTOSH. I think the answer lies in the purpose for which the aircraft is being used. This follows an ICC ruling, I might add, on trucks and buses. It has been in existence for years.

There is another fundamental difference between commercial carriage, Mr. Chairman, and private carriage. That rests in the liability. The Chicago Convention, the Warsaw and other conventions, were mentioned earlier. They cover commercial air operations and certain liabilities. In private operations, that liability rests with the company who operates the aircraft. An umbrella policy, if you will, for a corporation. Be that as it may, usually the people on board the company aircraft are either executives, customers, or have some relation to the company business or product.

Keeping that in mind, then the ground rules when you look at safety—let's not kid ourselves—we are also looking at the economics of safety as well. That includes the liability. That traditional differ-

ence has held for many, many years. We believe that we can still hold that and it is a proper holding.

I can assure you that no board chairman of any corporate aircraft is going to ride in an airplane or with a crew that is less competent or in less condition than what he would get from American or TWA. It doesn't work that way in the industry.

Mr. BURTON. That is not the group we are talking about. It is your testimony that with Cockroach Corner-type operations there is nothing wrong that enforcement of the present law would not correct.

Mr. MCINTOSH. That is correct. The reason that I stress the point, Mr. Chairman, is that your comments and other comments from this table would indicate that changing the existing rules would provide something else that would force those people to do something. I submit that no rule is worth a darn unless it is enforced. It seems to me the missing person at this table is the CAB which was mentioned a few moments ago. I hope that the CAB can work it out in such a way to show that the type of operation is, in essence, a commercial operation and, therefore, subject to the safety rules of 121. That way, we do not bother with 91 which is adequate.

Mr. BURTON. How could they claim that a group is a commercial operation if they are doing exactly what some of your members do and you don't want to become a commercial operation and, for example, lease planes?

Mr. MCINTOSH. We are not talking about the act of leasing making you a commercial operator. We are talking about what you are using the airplane for and your ability to handle the aircraft. That is what we are talking about. It is not a question of the Burton Shoe Co. hiring an airplane to haul its product. It is a question of the Burton Shoe Co. being able to exercise appropriate safety controls over that aircraft regardless of where you get the aircraft.

It is quite common for American corporations to lease aircraft, fly it with their own pilots or give it to a management firm to fly for them for which they are responsible. All of this is very legal. But this is not Cockroach Corner. You are talking about an act down there in which aircraft are permitted to become less than airworthy. Subterfuges are used in leases. There have been four or five leases, if I understood the testimony correctly, in a single day. It seems to me that the ground rules exist for either enforcement directly or designation of that type of operation as being a commercial operation.

Mr. BURTON. In other words, if they lease the plane to the hotel, and I am not really going as a passenger on the plane but as a hotel guest, there could be some definition that would make them commercial carriers on that basis?

Mr. MCINTOSH. Exactly.

Mr. BURTON. If I am Sears and Roebuck, and I lease a plane rather than buying one to fly around the board officers, et cetera, that is different.

Mr. MCINTOSH. It would be if Sears and Roebuck had an aviation department capable of handling the aircraft, and it so happens that Sears does.

Mr. BURTON. How about the Burton Shoe Co. that doesn't?

Mr. McIntosh. I think that if there are any rule changes there should be a clarification that would indicate that the Burton Shoe Co. must have a minimum of capability, whatever that would be.

This is what happened in the case of the Wichita football accident which caused subpart (d) in the Smith Report. This is obviously what occurred in several of the other crashes that have been discussed here today.

You simply cannot manage and operate an aircraft without some expertise.

Mr. Burton. That is where you enter into a contract with a firm that could almost be interlocked with the leasing company. In other words, if you lease a car from Hertz, you've got Hertz all the way.

Mr. McIntosh. Right.

Mr. Burton. If you lease a plane from, let's say, Air Hertz, but then Hertz just provides you with the plane and you have to get your own pilots and mechanics, et cetera. Then you can go across the way to another company, not Hertz, and get the maintenance and operation. As I understand the GAO testimony, it gets almost everybody off the hook except the poor schnook who signed the lease.

Mr. McIntosh. I hope your statement is not correct. I can't challenge it. I know of numerous instances in the United States where there are what we call "aircraft management firms." They will fly and maintain and crew my airplane.

Mr. Burton. A plane that you own?

Mr. McIntosh. Either I own it or I lease it. Those management firms are under the direct surveillance of the FAA. In fact, they are much easier to surveil than the random airplane with the crew chief, like the Constellation where the crew chief had his tools and his office in the back of his car.

An established address, maintenance facilities, equipment, and a shop. Those are the things that make it easier for the FAA inspectors to work with. I would have no concern with that type of management firm. They are in existence all over the United States with excellent reputations. It is all strictly legal. It is not the type of thing we are talking about in Florida.

Mr. Burton. In Florida, the operations are legal. We are not talking about illegal contracts. We are talking about how it is legal but by handling it the way they do, as I understand it, they don't fit within the definition of the law that would cover them with certain safety regulations.

There is nothing illegal about me owning a plane that may or may not be 100 percent sound, and leasing it to a gambling casino somewhere for them to fly their people to spend money. Nor is it illegal for my brother, whether his company is a firm for airplane management or a crew of mechanics, to supply an operation which they lease a portion of separately, and then fly the people down there with a pilot who just came off a 16-hour turnaround, using my plane that was less than sound. There is nothing illegal about any of those operations, and I tried to get away from illegality earlier with, I guess, FAA, because these things are legal. However, they are methods of avoiding some of the safety regulations.

Mr. McIntosh. If I may, let's start with your first statement. We have been working with the FAA on this problem for a long time. You must understand for an FAA inspector to walk out to a large airplane, let's say, of a DC–4 or a DC–6 category, or for that matter a DC–3, and within the space of an hour or so, determine whether the airplane is airworthy. That is impossible even for the most brilliant engineering inspector. You can check that the engines run well. You can check that the records might be up to date, but that can be a pencil entry. I appreciate that. You can cycle the propellers and you can do other things. In reality what you end up with is the fact that everything worked during that hour, and you have no feeling for the airworthiness or the flying ability of the aircraft.

So it involves a continuous surveillance. This is one of the reasons that subpart (d) requires a continuous inspection program that is documented and has to be approved. Each airplane has its idiosyncrasies. They have time limits on certain things. To do a good job on an airplane takes a period of time. I think the FAA has to fall back on a liberal interpretation. I am not saying this is right, but I think it is practical.

The regulations state, "You will not fly a plane unless it is airworthy." I understand there is nothing in the regulations today that says for a person who leases an airplane his responsibility for keeping it in an airworthy condition extends beyond the time when I deliver my airplane to you.

We have suggested to the FAA that they might want to dress this up to clarify this, particularly where the person leasing the airplane may have only minimal capability to care for the aircraft. This is one possibility.

The other thing is that it should certainly be against the law, and I don't think it is now, that I could lease you an airplane not in airworthiness condition and you, having no knowledge of aviation, could accept it and attempt to fly it without realizing what responsibility you had assumed when you affixed your signature to the truth-in-leasing statement. These are the things that I think can be clarified by the FAA without rewriting subpart (d). They would include requiring continuous maintenance programs, requiring ground proximity warning devices, requiring tape recorders, and all the other things they did not mention here and not needed.

I would add to this, if I might, that the counsel from the southern region was slightly inaccurate when he indicated that the business and corporate fleet were very much against subpart (d). This is not true. We played a large part in writing the final rule.

Mr. Burton. If you wrote it, you've got to be happy with it. How about the initial proposal?

Mr. McIntosh. The initial proposal would have made the business fleet operate like Pan American. It was totally impractical from an economic and a realistic point of view. To that extent, certainly we were against it. We even prepared a petition to the FAA for a separate rule covering business and corporate aviation because even then we were concerned, as expressed in the Smith report, with the type of thing that brings us here today. After much compromise, it was decided

that with proper enforcement and with proper rules they thought they could lick Cockroach Corner. This is not a new phenomena. It has been there for a long time.

The net result is that we are here again talking about it again. We submit to you that I think the CAB getting into the act and designating commercial operations under certain conditions and then the FAA enforcement will go a long way if not eliminating it.

I think you will find that the southwest region's track record in pushing them all back to Miami is something for your consideration.

Mr. BURTON. There is a difference between companies that lease planes to major corporations for corporate use and those who lease planes and are, in effect, commercial carriers. Maybe that is something that FAA has to consider. I strongly believe, and everybody but you has said it, that they have to upgrade the standards at least on those who, by definition, are commercial carriers and maybe define them as commercial carriers. I don't think anyone wants to unnecessarily burden legitimate operators. You happen to be in a field where you have some legitimates and some nonlegitimates and the nonlegitimates give you a bad name.

Mr. Butterworth?

Mr. BUTTERWORTH. On that same note, it is too bad they don't fly a particular type of aircraft because then we would know.

I think, to summarize, FAA's dilemma is that they claim it is difficult, if not impossible, to really put behind bars the man whose motive is to make money by operating unsafely. It is difficult if not impossible. Their only alternative is to create a set of safety rules for all large aircraft. Unfortunately, that encompasses aircraft that may be used safely anyway.

Let's forget about upgrading standards for a moment. They did make other proposals which would give them greater access and help enforce regulations and determine commercial operations. They want criminal authority. They want the ability to level higher civil penalties. Would you support these?

Mr. MCINTOSH. Yes; we have never argued with the fact. Even today it costs $1,000 if you are caught operating under 91 and it is determined you should be operating under 121. That costs you $1,000. For every rule in 121 you have not been complying with that is an extra $1,000.

So technically—and I don't know how many rules there are in 121—but you could theoretically be hooked for as much as $75,000 or $80,000 if the FAA wanted to go that route.

I assume that you realize that if they raise this to $25,000 or any other reasonable considerably higher figure, there must be an appellant arrangement made so that the FAA doesn't end up being judge, jury, and prosecutor.

Mr. BURTON. They would be by necessity. There is no way in the world that an agency can do that where you don't have an appellate way to go. I would think more important than the fines would be the ability to stop airplanes like the one where the pilot was told not to take off because the plane was unsafe, and he just took off. I think it would be more important than being able to fine somebody, to be able to stop something before it happens.

First of all, if they get a fine I guess it has to go through the Justice Department to be levied. You have to have due process and a day in court. There would be an appellate process to that.

I would think the ability to do what a fish and game warden or even a park ranger could do would be more important. Out in my district he can arrest you for picking wild flowers.

Mr. McIntosh. We would agree with that. The statement of that incident was news to me. It came as a shock because in our industry it is not unusual in extreme cases where an FAA inspector has stood by the airplane and said, "This airplane is grounded and that is the law." It is that simple.

Mr. Burton. You are talking about legitimate people and legitimate corporations—some big corporations, such as RCA. They are either too smart to fly an unsafe plane or just not going to take the chance because of public relations. Unfortunately, the entire lease area does not contain only responsible citizens like yourself and those you are speaking for.

Mr. McIntosh. I appreciate that, but you must understand, Mr. Chairman, that we constitute over 90 percent of those operating under 91(d). We must come up and be sure that your subcommittee fully understands the impact of any recommendations that you and the FAA might make to change part 91 as against other possible alternatives.

Mr. Burton. I think it is a very good point, although the testimony from the GAO differs with yours as far as the standards are concerned. But I think you make a very good point. What we are trying to do is correct the problem and if the problem really doesn't exist in 90 percent of the area, and if the problem can really be corrected by addressing definitions to that other percent, that's the way it should be done. But there is definitely a difference between 121 and 91(d) or there would be any 91(d). They would all fly under 121. It is not that there aren't valid reasons, as you put it, for the difference.

Mr. McIntosh. The method results in different regulations and the liability results in different regulations. It is not a difference in equivalency, sir.

Mr. Burton. I am not disagreeing with you because I don't know. However, you are the only one who is stating that position.

Do you have any questions?

Ms. Halterman. No.

Mr. Burton. Thank you very much, sir, for your testimony. Listening to the FAA, I would think that by the time we got any report out with firm recommendations they are going to have every problem solved except the need for a collision avoidance system.

Your statement has been made a part of the record and the record will remain open for a reasonable time for any other interested persons, or if you want to send any further information.

[Mr. McIntosh's prepared statement follows:]

PREPARED STATEMENT OF FREDERICK B. MCINTOSH, DIRECTOR, OPERATIONAL SERVICES, THE NATIONAL BUSINESS AIRCRAFT ASSOCIATION

Thank You, Mr. Chairman, Members of the Committee:

My name is Frederick B. McIntosh and it is a pleasure to respond to the Committee's request to share with you business aviation's views of the regulatory environment and its effectiveness as developed and administered by the Federal Aviation Administration (FAA).

The Nation's business aviation fleet includes more than 50,000 airplanes and helicopters used for a great variety of chores. They vary in size from small single-engined, single pilot airplanes used for pipeline patrol to large airplanes common to the world's major airlines used to carry some major leagues' teams to distant 'away' games and airlift entire construction or drilling crews to distant sites.

They are aircraft used in private transportation for the account and the benefit of the owners or operators of the aircraft. As such they are operated under the regulatory philosophy and safety regulations of Federal Air Regulation, Part 91. When aircraft are used for direct return of transportation compensation or for hire, operations must be conducted under other appropriate FAR's such as FAR 121 or FAR 135.

It is our intent today to outline these well-defined regulatory and legal differences; to demonstrate to you with facts and data that the fundamental regulatory structure has stood the test of time and is, we sincerely believe, more than adequate for the forseeable future.

We wish to initially correct, what we feel, is a most important potential misconception. Much of the discussion before this Committee and inputs from the National Transportation Safety Board alleges that a specific small subpart of the Federal Air Regulation, namely FAR 91, Subpart D, is a weak point which may be responsible for certain actions or accidents.

Subpart D came into being as the result of a tragic accident in which the doomed aircraft was dry leased, but Subpart D only applies to certain categories and classes of aircraft. The philosophy behind leasing aircraft is uniform throughout the air regulations. For example, the Truth in Leasing requirement is contained in FAR 91.54 (Subpart A) and applies to all forms of leasing.

It should be apparent to the Committee that Subpart D comes into discussion only because the aircraft involved in the incidents and accidents being discussed are of a weight or powerplant class that requires certain actions under Subpart D. The air regulations, further, do not at any place outline any specific permissive rules for dry leases.

A dry lease is noncommercial and the rules of FAR 91 therefore apply.

But first, the Committee should be aware of the NBAA's interest and source of expertise in this area. For 30 years, the NBAA has represented business aviation. Our 1,700 plus member companies operate in excess of 3,500 aircraft in the daily pursuit of their businesses, their aircraft including the major portion of those aircraft required to operate under the rules and regulations of FAR 91, Subpart D.

We were pleased to play a major role in the creation and structuring of the existing Subpart D by invitation from the Department of Transportation following the tragic Wichita football team charter accident in October, 1970, and later in the implementation of the Admiral Smith report by the FAA.

Two important regulatory definitions should be clarified initially:

1) All aircraft must meet an engineering regulation--a design approval, if you will. It is on the basis of this regulation that type certification is granted and, most important for the purpose of these hearings, sets the standards for airworthiness for that aircraft. Most aircraft operated under Subpart D are required to be certificated under FAR Part 25 (which includes aircraft commonly used in certificated airline service, by the way.)

2) Second, all aircraft must be flown in accordance with an operating rule in addition to its airworthiness regulation. For private aviation, that rule is FAR 91. For aircraft involved in providing direct transportation for hire and compensation, that rule is usually FAR 121 for the class of aircraft we are discussing here today.

The basis on which this traditional differentiation between private and commercial exists is well-founded in the entire transportation industry including busses and maritime transport. The liability coverage methods of private transport and that held out to the public are entirely different. All passengers, and crew of a privately operated aircraft are covered under the operator's liability insurance. No international conventions or other protocols exist of the form or legality of the Chicago or Warsaw Agreements that cover commercial travel systems including air travel.

The people flying and riding in privately owned aircraft usually have a vested interest in the operational condition and proficiency of their crews. They are usually all employees of the same company or related business interests.

The effectiveness of this philosophy can best be illustrated in reviewing safety statistics. Perhaps 90% or more of those aircraft operated in private carriage and operate under Subpart D, are aircraft operated by American business aviation. A recent review of National Transportation Board (NTSB) records, revealed that business aviation's safety record was essentially equal to the certificated airline record. In the turbojet category, over a five year period, business aviation's record usually exceeded commercial carriers.

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Since accident statistics will be or have been quoted in this hearing, we should point out to the Committee that care must be used to compare accident data on the same terms. Commercial operations are computed only when there is a revenue passenger aboard, training, ferry flights and maintenance test flights are not included. In general aviation or FAR 91 accident data, the NTSB includes all flights including ferry, training, etc. and the published results are not directly correlatable - a situation not easily discerned by non-aviation people.

NBAA members are as vitally interested in aviation safety as anyone, either in or out of government and we constantly monitor the accident records of our industry. In addition, NBAA maintains technical and operational committees which have created operating and maintenance standards of the highest possible level--just for safety.

So, the evidence shows that engaging in private carriage and operating under the provisions of FAR 91, Subpart D, has in no way derogated safety, certainly not for the privately operated American business aviation fleet.

We have consistently used the term "operator" rather than perhaps the expected "owner". This was deliberate and brings us to a discussion of aircraft leasing. The leasing of transportation equipment, is common to all modes: trucks, buses, ships or airplanes.

Many companies satisfy all their transportation needs by leasing. In the case of aircraft, banks or other lending institutions, holding companies and aircraft leasing companies actually own the aircraft and lease them to their customers. This form of lease is referred to in the industry as a "dry lease". The term "dry" referring not to the provision of fuel but to whether the driver or pilot goes with the truck, bus or airplane. Conversely, a "wet" lease would have the Lessee providing the driver or pilot with the truck or airplane.

Wet leases are only permitted to operate under FAR 91 D in a single narrow application known as "time sharing" (FAR 91.181). Under time sharing, which is not pertinent to these discussions but should be noted for the record, only very specific items are permitted cost recovery, thus guaranteeing that any such operation cannot under any circumstances even break even let alone show a profit on the flight.

We now are in a position to pull these apparent diverse parts together and more exactly assign and discuss the areas of responsibility under FAR 91 as it affects private operation.

The Federal Air Regulations clearly specify that the pilot-in-command of an aircraft flown under FAR 91 is in operational control of that aircraft. Thus the employer of that pilot is ultimately responsible for the operational control of that aircraft. In a typical business aviation operation, a company employee, usually a pilot, is assigned responsibility to see that all applicable Federal air regulations are complied with including the airworthiness of the aircraft and the proficiency of the pilot(s) who will fly the aircraft. The physical maintenance and inspection of the aircraft is handled either by the aircraft operator with his own personnel or contracted out as need be. In most corporate operations, moderate and normal maintenance including routine inspections are usually done in-house with major items done on contract.

Please note that the actual ownership of the aircraft is not pertinent. The aircraft could have been leased for a period of time; it could be purchased on a leasing arrangement with possible credit towards purchase, etc. The key is the employer of the pilot-in-command. Inspection and maintenance may be purchased or contracted to others but operational control still legally remains with the pilot under FAR 91.

Another fundamental regulatory consideration is purpose for which the aircraft is being used. If the aircraft is being used as a source of direct revenue, it is a commercial operation for compensation and hire and other appropriate FARs apply.

There are no extenuating circumstances, you are either selling transportation or you are not. The proper FARs (FAR 121 or 135) prescribe specific requirements which must be complied with.

This apparent line of distinction appears to have caused or provided a means by which certain operations give the impression of circumventing the law. Perhaps an example will help. Suppose there is a company which manufactures shoes, the Burton Shoe Company, which needs to airlift either raw materials, partially completed shoes, or even the finished products and goes to an aircraft leasing company to lease an aircraft. Air transportation is not the Burton Shoe Company's primary business, making and selling shoes is what the company does.

If Burton has on its company staff a knowledgeable aviation person qualified to insure proper operation of such an aircraft, Burton may well dry lease the aircraft and hire a crew to perform the flights. Thus exercising complete operational control with all flights in direct support of their primary business: shoes.

If Burton does not have a reasonably qualified person to do this for the company, Burton would not attempt to assume this responsibility but would make a wet lease where the company providing the aircraft also provides the crew and would be held responsible for the crews competancy, the aircraft airworthiness, etc. Such an operator (lessor) will hold an appropriate air taxi/commercial operators certificate because his aircraft are being used as a direct source of financial return in transportation. The net effect being one of a commercial charter type flight.

By contrast, it is not uncommon for companies, the Burton Shoe Company, for instance, to own (or lease) the aircraft and hire a management firm to operate the aircraft and be responsible for the crew training, maintenance, etc. However,

this act does not relieve the Burton Shoe Company from any liability and it remains exactly the same as though Burton owned, operated and crewed the airplane with their own personnel.

This detailed description of how responsible industry interprets and complies with the existing Federal Air Regulations leads us next into the supporting analysis of the individual safety regulations, their requirements and means of compliance and Federal surveillance.

First, the human element: the pilot.

It is against the law for a person to act as a pilot-in-command or an aircraft crew member if that person does not have the necessary aeronautical ratings plus an appropriate medical certificate. Further, in most cases, certain specific periodic flights and/or other proficiency checks are required for that person to act as a crew member.

The important point here is that it is the individual's responsibility to see that they conform to the necessary regulations. Failure to do so is subject to specified penalties. Further, it is the crew member's employer that is restrained from requiring that person to fly when those applicable standards have not been met, but the fundamental responsibility remains with the crew members themselves.

Some of the accidents referenced have involved violations of these rules as outlined in FAR 61. It was not the regulation that was at fault but the individual's failure to comply, whether willfully or inadvertently is immaterial.

The fact that some pilots choose to seek single flight employment has no legal bearing on the matter, it is the individual's responsibility that he comply with the appropriate rating and certification requirements for the aircraft and flight plan contemplated. It is an additional requirement that the pilot's employer confirm that his employees have the appropriate experience, ratings, etc. before assigning them to a crew position and flight plan.

If an aircraft lessee should secure pilots from an employment agency, the lessee would obviously be derelict if he did not utilize some method of assuring himself that the pilots so offered for employment were in compliance with the necessary regulations. This can be done by the simple technique of appropriate hiring agreements with the pilot(s) and/or the employment agency providing the crew (and FAA check).

In one accident, admittedly before FARs 61 and 91 were revised, the copilot on the surviving aircraft admitted that he had never been aboard that make and model of aircraft prior to that flight! Today, that would be a blatant violation of the law. At that time, speaking from a conscientious pilot's point of view, the violation was one of professional morality, but more regulations won't solve this human problem.

Next, many accidents have had inadequate maintenance or unairworthiness cited as causal factors. In the case of heavy aircraft of the type we are discussing the requirements for an FAA-approved inspection program are very explicit. In addition, the name of the person responsible for the compliance with FAA regulations is also provided the FAA. The FAA not only retains the right to inspect these aircraft at any time they wish but further requires not less than 48 hours advance notice before the first flight to be conducted under the terms of a lease agreement (FAR 91.54). This notice was to permit an FAA inspector an opportunity to examine the aircraft if he deemed it necessary. Failure to notify the FAA is a violation, failure to inspect is an FAA decision.

There is one final area that must be considered if we are to have a complete picture of how the regulations are designed to operate, separating private from public and commercial carriage. That is the regulatory term "operational control".

The Air Regulations define "Operational Control" to mean the exercise of authority over initiating, conducting, or terminating a flight (FAR 1)". This concept is fundamental to the use of leased aircraft in private carriage. Under

FAR 91, operational control must remain with the person or company that has leased the aircraft and will be responsible for its itinerary, its crew and its airworthiness. The company exercising operational control is also the company for whose business the act of leasing is being utilized.

The responsibilities both explicit and implied cannot be transferred to another party except with the express permission of the FAA. It is for this reason that FAR 91.54 specifically requires a Truth in Leasing statement to be part of every lease. This statement is required to contain information on important safety items including designation of ultimate responsibility or operational control.

This section was purposefully added to the regulations to inform non-aviation people of the responsibilities they assumed when they leased an aircraft.

Some examples, perhaps will help here also:

1) Burton Shoe Company dry leases an aircraft to transport products and company personnel, guests and customers. The pilots are hired from an employment agency. Burton Shoe Company, as the operator of that aircraft is deemed to have operational control under the FARs.

2) The shoe company dry leases an aircraft and contracts with another agency to provide the necessary aircraft inspections, maintenance and to provide the pilots when necessary. This, too, is a common and legitimate private operation under FAR 91. Again, the Burton Shoe Company is deemed to exercise operational control and is held responsible for the aircraft operation and its crew and maintenance including the agency which provided the maintenance and pilots' services. All very legal and very much in common practice.

A third example should be included to show the value of the leasing capability to business aviation:

The Burton Shoe Company already owns and operates (or leases) aircraft for use in their daily business of making and selling shoes. An intensive sales or factory construction program requires an additional aircraft for 30 days or 6 months.

The aircraft is dry leased and flown and maintained by Burton personnel already on the payroll. This is perhaps the most common practice in business aviation where transportation requirements do not justify a permanent expenditure for another aircraft.

We are sure that when we quoted the second example of common leasing practices that many Committee members and staff mentally said that is a perfect description of "Cockroach Corner" as typified by the GAO and NTSB data. We respectfully disagree with you as we use the example in terms of willfully and voluntarily knowing and abiding by all applicable regulations.

We have not mentioned enforcement of regulations until now because we wished to submit to the Committee what we believe is sufficient and adequate data that would, by the strength of its factual content, lead the Committee to believe, as we do, that further regulations are not required to solve this apparent problem. Enforcement is.

Regulations are usually created to treat the minority numbers of the offenders and this case is no exception. The FAA has admitted that they know the primary operators who engage in these practices; FAA knows the aircraft involved; FAA knows who the lessees are that have these aircraft available; FAA has the regulations already on the books by which to require compliance or ground the aircraft.

In conclusion, Mr. Chairman, NBAA, as representatives of the owners and operators of the Nation's business aviation fleet, strongly urges you to give whatever guidance and counsel may be necessary to the FAA to utilize their existing resources and to provide additional resources if necessary. More regulations are not the answer. Those people whose business practices we have been discussing today have not complied with either the spirit or intent of the existing regulations and there is no hope or indication that their reactions to additional regulations would be different or more encouraging.

It can cost you $1,000.00 for not operating as a commercial operator plus an additional $1,000.00 fine for each regulation that you failed to comply with. We question how many such compliance actions could be absorbed by the operators under discussion. For that matter would they have the resources to challenge such Federal action in the courts? Based on our knowledge of the industry and the legal history of cases involving safety regulation, the FAA is on solid ground.

We are most appreciative of this opportunity to discuss with you these important regulations and their potential harmful effects on business aviation.

Mr. BURTON. Without objection, the record will remain open at this point for the purpose of inserting any additional material or information which might be submitted.

Mr. MCINTOSH. Could I ask Mr. Butterworth one question?

Mr. BURTON. Certainly.

Mr. MCINTOSH. Was it intended, since the Smith report has been referred to by so many witnesses in so many question and answer periods, for a copy of the report be made a part of the record?

Mr. BURTON. Certainly.

Mr. MCINTOSH. If not, I would ask that it be done.

Mr. BURTON. We will do that.

Without objection, a copy of the Smith report will be inserted into the record at this point.

[The DOT report to the Secretary entitled "Investigation of Charter Aircraft Services," dated February 5, 1971, is in the subcommittee files.]

Mr. MCINTOSH. Thank you.

Mr. BURTON. I am sorry you had to wait so long. We never have an easy time with Mr. Bond.

The subcommittee will now be adjourned.

[Whereupon at 4:05 p.m., the subcommittee adjourned, to reconvene subject to the call of the Chair.]

APPENDIXES

Appendix 1.—Stimpson Testimony

STATEMENT OF

EDWARD W. STIMPSON

PRESIDENT, GENERAL AVIATION MANUFACTURERS ASSOCIATION

ON AIRCRAFT CERTIFICATION

PREPARED FOR

SUBCOMMITTEE ON GOVERNMENT ACTIVITIES AND TRANSPORTATION

HOUSE GOVERNMENT OPERATIONS COMMITTEE

The General Aviation Manufacturers Association is an independent trade association representing 38 companies that produce General Aviation aircraft, engines, avionics, and component parts.

Our Members produce aircraft that are certified under FAR Part 25, the Transport Category Certification Standards, as well as under Part 23, the Standard for Normal and Utility Category Aircraft. Part 25 applies to all aircraft that have a maximum gross takeoff weight in excess of 12,500 pounds. In the United States, there are approximately 2100 turbojet business aircraft, in addition to 2600 turbojet aircraft utilized by the commercial airlines - all certificated under the same standard, Part 25.

During this calendar year, members of our Association will deliver approximately 250 new business jet aircraft. Obviously, we are vitally concerned with the aircraft certification procedures of Part 25, as well as Part 23. Consequently, we believe we can contribute to the proceedings of this Committee, and are disappointed that we did not have the opportunity to appear before the Committee to respond to any questions you might have concerning our views.

The FAA Type Certification process was provided for by Congress, under Title VI of the Federal Aviation Act, to promote flight safety and protect the public. Under this process, the FAA establishes detailed rules and regulations for aircraft certification in accordance with the Administrative Procedures Act. All interested parties, including trade associations, unions, individuals, foreign governments, and other U.S. Gvernment agencies, have an equal opportunity to propose rules and comment on the proposals of others. Public hearings are a normal part of the rulemaking process.

When a manufacturer desires to build and certificate an aircraft, engine or other component parts, in accordance with the established rules, he applies to the FAA at the initiation of the program. The rules that must be met by the manufacturers are those rules in effect on the date of the manufacturer's application. In addition, after FAA study of the details of the design, FAA adds whatever special rules it determines are necessary to cover new design concepts that may not have been contemplated in the current rules.

The certification process is lengthy and complex. For a new aircraft, the process requires the review and approval of the design and all of the engineering concepts; the manufacture of the prototype aircraft and the flight test program. Separate certification programs are established for the production of the aircraft and safety approval for <u>each</u> individual airplane. Typical certification programs take three to four years for the smaller aircraft, and up to five years, or longer, for the large airline type aircraft. Thousands of individual inspections and approvals are accomplished in the process, involving many thousands of engineering manhours on the part of the manufacturers and the FAA.

The overall certification process is overseen by a FAA Type Certification Board, comprised of FAA officials. The FAA is responsible for determining that a manufacturer meets the established safety standards prior to certifying any aircraft. At any time throughout the process, FAA may hold hearings on certification issues or reopen a specific certification program, if it deems necessary.

Overall, the certification process has worked well and the public interest has been well protected. This is borne out by the excellent safety record that has been established. A major factor in the establishment of this excellent safety record has been the quality of the aircraft that have been certificated.

Recently, allegations have been made concerning the integrity of the certification process. While some specifics have been cited, the allegations may be generalized as follows:

1. Through the use of Designated Engineering Representatives, the industry is self-regulating itself to the detriment of the public.

2. Critical safety information is not being considered under the current certification process and an "open certification" process should be instituted.

Both of these allegations deserve attention.

Use of Designated Engineering Representatives (DER)

The use of individuals other than FAA employees to perform certain inspections and certifications has been a long standing practice in all phases of the aviation system. This has been the case for the certification of airline pilots, mechanics, and airports, as well as for certain

aspects in aircraft certification. If this system should ever be abandoned, many thousands of employees would have to be needlessly added to the FAA payroll at a substantial increase in the federal budget.

Designated Engineering Representatives, persons who have been individually determined by FAA to be highly qualified in specific engineering diciplines, and who are employees of the manufacturer, perform thousands of less crucial inspections. In fact, they accomplish the majority of inspections relating to certification. FAA, however, retains the approval authority for all aspects of certification and may (and often does) review any aspect at any time. It must be remembered that FAA establishes the regulatory basis for certification, the criteria to be used, the test procedures, etc. In almost all major tests and evaluations, such as flight or structural tests, FAA actively participates throughout the process. The Type Certification Board, which oversees the overall certification process and finally grants the certificate, is composed entirely of FAA employees.

The charge has been made that the DER has a conflict of interest between his employer and the government. On close examination, there is no conflict. In this era of product liability and lawsuits, a company cannot afford to build aircraft that do not meet safety standards established by the Government. It is clearly in the manufacturers best self-interest to provide knowledgeable, objective and conscientious DERs to assure both the Government and the manufacturer that all regulatory requirements have been met or exceeded. In addition, the marketplace will quickly react strongly against any manufacturer which might attempt to produce and market aircraft which do not meet established safety standards.

The system of delegation to make routine findings of compliance with the rules, spot checked by FAA, has worked well. The evidence does not indicate a need to abandon a procedure that is adequately protecting the public interest.

Open Certification

The Air Line Pilots Association is demanding that public hearings be held as part of specific aircraft certification programs. Currently, there is no established need that justifies public hearings on individual certification procedures.

When FAA establishes the rules, all interested parties have an opportunity to comment. In the past three years, four major hearings have been held, lasting from three to eight working days. In December 1974, in a two-week period, FAA considered over 1,000 proposed changes to the certification standards. At this meeting, there were approximately 700 in attendance representing FAA, foreign certifying authorities, U.S. and foreign aircraft manufacturers and airlines. More than 35 airline pilots attended this meeting.

At any point, information can be submitted to the FAA by an interested party, i.e., pilots association, governmental authority, etc. However, at some point a judgment must be finally made. Congress has delegated this authority to the FAA.

If Congress should now mandate public hearings on detailed certification of individual aircraft, a number of serious ramifications would occur.

1. The provisions of the Freedom of Information Act that protect proprietary information would be virtually nullified. FAA currently has access to all of a manufacturers data, including proprietary data, engineering and design know-how, and production plans. In open hearings, this would all become available to the public domain.

2. Tremendous delays would occur as hearings were held on detailed individual approvals of specific design features or tests. Aircraft certification is an extremely costly and complex process. A delay of just a day on a major program can cost tens of thousands of dollars.

3. Foreign manufacturers would have unlimited free access to all information regarding U.S. aircraft design and engineering and production plans. Currently, U.S. leadership in aviation is being seriously challenged by a number of foreign competitors. The U.S. position of technical expertise must be protected.

In short, any hypothetical or small advantage to the public in making proprietary data available would be overwhelmed by the disadvantages of inhibiting improved designs as there would be no protection of proprietary information, and the additional, prohibitive cost of delays in the certification program.

Summary:

The FAA certification process can always be improved. In the past, we have made recommendations for improvements. The concept of regular airworthiness reviews is one that have been strongly supported. We have also recommended the establishment of a Government civil aircraft engineering flight test pilot school, which has been eliminated from the FAA budget

on several occasions. This would standardize the training for both Government and company test pilots and remove as much subjectivity as possible from the critical area of flight test.

The safety record of U.S. manufacturer products is in large part attributable to the progressive regulatory environment which has permitted manufacturers to build safe, complex, modern aircraft. Our ability, as manufacturers, to compete in the world marketplace is directly attributable to our ability to build aircraft that can be operated safely.

We would urge that any steps taken to change the certification process be forward steps that build upon and improve our present system. We certainly should not take backward or regressive steps that will introduce changes that will have a negative impact upon the certification process and, consequently, air safety.

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Appendix 2.—AIA Submission

STATEMENT OF THE GENERAL ELECTRIC COMPANY CONCERNING CF-6 ENGINE

The General Electric CF6-6 engine was certified by the FAA on September 16, 1970. It is currently in service on the DC-10-10 aircraft. The General Electric CF6-50 engine was certified by the FAA on March 23, 1972. It is currently in service on the McDonnell Douglas DC-10-30, Boeing 747 and Airbus Industrie A300 Aircraft.

Both the CF6-6 and the CF6-50 engines complied with all the requirements of the Federal Aviation Regulation and Advisory Circulars* applicable at the time of certification, as well as with test plans submitted to and approved by FAA.

Application for type certification of the CF6-6 engine was filed by GE on July 3, 1968. The FAA required compliance with the Federal Aviation Regulation (14 Code of Federal Regulations 33), effective February 1, 1965, and the Advisory Circular 33-1A, which was issued on June 19, 1968. The Federal Aviation Regulation, Part 21, requires conformance to regulations applicable at the time of engine certification application. Therefore, the CF6-6 was certified according to the regulations in effect at that particular time.

Application for type certification of the CF6-50 engine was filed by GE on September 5, 1969, and, therefore, that engine also conformed to the Federal Aviation Regulation and Advisory Circular 33-1A, which were in effect at that time.

Contrary to the ALPA assertion, certifications of the CF6 engines were not based at all on the Pratt & Whitney JT9D engine. The JT9D engine was tested and certified

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*Advisory Circulars are intended to clarify and interpret the Federal Aviation Regulation so that the manufacturers can comply with the intent of the Regulation. Advisory Circulars illustrate one means, but not the only means, of complying with the Regulation. Provisions are made that if a manufacturer can demonstrate equal safety and this is accepted by FAA, then this means of certification can be used to comply with the Federal Aviation Regulation.

under Advisory Circular 33-1, which, at the time of the certifications of the CF6 engines, had been superseded by Advisory Circular 33-1A.

ALPA also stated that the FAA certified CF6 engines under "special conditions" which "allow manufacturers to set their own certification standards if they can provide to FAA a satisfactory design and engineering basis for an exception to the existing rules." Of course, the FAA is authorized by law to establish "Special Conditions" as it deems necessary to discharge its certification responsibility. Such Special Conditions are not exceptions to certification criteria, but rather represent additional or unique requirements deemed necessary by the FAA for a particular engine. The GE CF6 certification tests conducted in 1970 to the then current FAA regulations were executed fully in agreement with FAA interpretation and were considered more severe than specified. Moreover, there were no Special Conditions relating to the CF6 fan or fan blades.

Reflecting experience with the TF39 engine, which GE had previously developed for the USAF C5A transport, both the CF6-6 and the CF6-50 engines were certificated with gun drilled fan blades; i.e., blades with weight reducing holes drilled down within the outer panels. As of September, 1970, the TF39 engine had accumulated over 12,000 hours of factory test and over 37,000 hours of flight operation. Thus, drilled fan blades did not reflect new, much less an advanced, state-of-the-art technology at the time of CF6-6 and CF6-50 certifications. Rather, the configuration had been introduced as early as 1965 in the TF39 engine design as a means to reduce the centrifugal load and thereby reduce stresses on the fan blade and disc dovetails for improved engine life and integrity. Except for very recent new engine models, CF6-6

and CF6-50 fan blades are identical and, in fact, may be used interchangeably and intermixed.

Through August, 1978, CF6 engines had accumulated over 10,000,000 in-service flight hours. The CF6 engine in-flight shutdown rate was .042 (4.2 per 100,000 flight hours) and the unscheduled engine removal rate was .304 (30.4 per 100,000 flight hours). Clearly, CF6 engines have demonstrated a high degree of reliability over an extended period of service.

As stated above, the gun drilled fan blade design was adopted as a means to reduce fan blade and disc dovetail stresses. Subsequently, solid fan blades were introduced into production and offered to the airlines on an optional basis to improve airline economics by reducing resultant engine damage following foreign object ingestion. In no way were considerations of flight safety involved in the decision to offer a solid fan blade. Availability of the solid blade was announced by General Electric Service Bulletins 72-444, dated October 5, 1973, and 72-161, dated November 12, 1973, after having been approved by the FAA. Notwithstanding the availability of solid fan blades, gun drilled fan blades are being replaced by the airlines on an attrition basis only.

On June 11, 1974 the Great Lakes Region of the FAA issued a Notice of Proposed Rule Making proposing the issuance of an Airworthiness Directive which would have required replacing gun drilled blades with solid blades and soliciting comments thereon from interested persons. In the response to the NPRM, it was pointed out by the Air Transport Association (ATA) that a cost of $47,000,000 would have to be borne by the industry for a retrofit program, and certainly, if safety was not an issue, this would be an exhorbitant sum to pay for a product improvement. If, however, a safety issue were found, studies would be conducted to show the time required to retrofit the

entire fleet. After reviewing all of the various submissions by interested persons, including GE, the FAA on September 10, 1974 rescinded the proposed Airworthiness Directive on the grounds that a flight safety issue did not exist. So far as GE can determine, ALPA did not submit any comments in response to the NPRM.

While it is true that an Airworthiness Directive (AD) was issued by the FAA, it was not issued against the CF6 engine. The AD, as amended, required modification of the DC-10 aircraft to incorporate shielding to protect the fuel lines to the CF6 engine with gun drilled blades in the tail position on that aircraft.

Subsequently, the Special Subcommittee on Investigations (Staggers Subcommittee) of the Committee on Interstate and Foreign Commerce of the House of Representatives conducted a review of the FAA's actions regarding the CF6 gun drilled fan blade. In the course of this investigation the Subcommittee, by letter dated October 11, 1974, requested the National Transportation Safety Board (NTSB) to conduct a study and investigation of the FAA's action. Thereafter, on March 7, 1975, the NTSB issued its report "Airworthiness of CF6 Engines with Drilled Blades" in which, among other things, it concluded that "[N]either aircraft airworthiness nor individual passenger safety is compromised by the use of drilled fan blades in the CF6 engine."

ALPA has suggested that an Overseas National Airways DC-10 was destroyed because of the use of gun drilled fan blades. It is GE's conviction that the use of gun drilled fan blades in #3 engine in no way contributed to the engine failure or loss of the aircraft. In the attachment to the statement of J. J. O'Donnell

relative to the CF6 engine, it is stated on page 4 that "drill tip blades disintegrated into shrapnel and blasted through the engine shroud and into the wing and fuselage." In fact, in the investigation of this accident there was no evidence that engine shrapnel from the fan blades penetrated either the wing or the fuselage of the aircraft, nor was there any evidence to support that the blade shrapnel penetrated any fuel lines.

Relative to the abradable epoxy shroud quote from the NTSB report, a tremendous analytical and test program was initiated by GE and Douglas. This program was, and is, without precedent in the industry and there would be no way for either the FAA or the industry to have predicted the events involved in this engine's failure. With the identification of the unique phenomena associated with the abradable shroud material, the problem with foreign object ingestion on the CF6 engine is no different than that associated with any other jet engine. Namely, the most serious consequence is the loss of power on the affected engine. Loss of power is addressed and is properly accounted for in aircraft performance testing.

DOUGLAS POSITION ON CF6 GUN DRILLED FAN BLADES VS. SOLID FAN BLADES

The General Electric CF6-6 engine was certified by the FAA on September 16, 1970. It is currently in service on the DC-10-10 aircraft. The General Electric CF6-50 engine was certified by the FAA on March 23, 1972. It is currently in service on the McDonnell Douglas DC-10-30, Boeing 747 and Airbus Industrie A300 aircraft.

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Through August 1978, CF6 engines had accumulated over 10,000,000 in-service flight hours. The CF6 engine in-flight shutdown rate was .042 (4.2 per 100,000 flight hours) and the unscheduled engine removal rate was .304 (30.4 per 100,000 flight hours). Clearly, CF6 engines have demonstrated a high degree of reliability over an extended period of service.

As stated above, the gun drilled fan blade design was adopted as a means to reduce fan blade and disc dovetail stresses. Subsequently, solid fan blades were introduced into production and offered to the airlines on an optional basis to improve airline economics by reducing resultant engine damage following foreign object ingestion. In no way were considerations of flight safety involved in the decision to offer a solid fan blade. Availability of the solid blade was announced by General Electric Service Bulletins 72-444, dated October 5, 1973, and 72-161, dated November 12, 1973, after having been approved by the FAA.

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ALPA has suggested that the FAA certified CF6 engines under "'special conditions' which allows manufacturers to set their own certification standards if they can provide a satisfactory engineering basis for an exception to the existing standards." Of course, the FAA is authorized by law to establish "Special Conditions" as it deems necessary to discharge its certification responsibility. Such Special Conditions are not exceptions to certification criteria, but rather represent additional or unique requirements deemed necessary by the FAA for a particular engine. The GE CF6 certification tests conducted in 1970 to the then current FAA rules were executed fully in agreement with FAA interpretation and were considered more severe than specified. There were no Special Conditions relating to the CF6 fan or fan blades.

ALPA has suggested that an Overseas National Airways DC-10 was destroyed because of the use of gun drilled fan blades. It is GE's conviction that the use of gun drilled fan blades in #3 engine in no way contributed to the engine failure or loss of the aircraft.

Relative to the effects of the abraidable epoxy shroud quote from the NTSB report, a tremendous analytical and test program was initiated by G. E. and Douglas to investigate this engine failure. This program was and is, without precedent in the industry and there would be no way for either the FAA or the industry to have predicted the events that caused this engine's failure. With the correction of the unique phenomena associated with the abraidable shroud material, the problem with bird strikes on the CF6 engine is no different than that associated with any other jet engines. Namely, the most serious consequence of a bird strike is the loss of power on the affected engine. Loss of power is addressed and is properly accounted for in aircraft performance testing.

AIA STATEMENT REGARDING WET RUNWAY LANDING CERTIFICATION PROCESS

The ALPA has criticized the FAA certification process for determination of landing distances. The ALPA does not imply that certification testing is not conducted in accordance with the rules, but rather that the rules are not correct since they do not require the tests to be conducted on a wet runway.

While it is true that the certification rules require landing distance tests on dry runways only, the certification practice used by FAA does require landing tests on wet runways to demonstrate that the brake-wheel-tire-antiskid combinations insure satisfactory operation on slippery runways. The landing distance tests conducted in accordance with the certification rules establish a certified landing distance. The operational regulations require that the certified distance be increased by 67 per cent to establish the operational FAR landing field length for dry runways. These same rules require that the dry FAR landing field length be increased an additional 15 per cent to establish the FAR landing field length for wet runways. The operational wet landing field lengths then are 92 percent longer than the certified distance.

The landing tests conducted on dry runways using the current rules provide a good basic engineering yardstick from which baseline data are established for expansion into operational data using the factors to cover the operational variations. The determination of these distances is a carefully controlled engineering test under as ideal conditions as possible. The dry runway is the only type surface which can be controlled for testing. There are many operational variations which influence landing distance, including variable surface conditions. To cover all these variations in testing is impractical, and would not provide baseline data for expansion. The current factors being applied to the baseline test data result in the field lengths that years of observation have proven to provide the approriate margins of safety.

The ALPA contends that hundreds of accidents and incidences would have been prevented if FAA required certification tests on wet runways. During a 1975 FAA landing rules meeting, the ATA presented an analysis of some 93 accidents/incidents which FAA reported as being related to jet transport wet runway operation. The ATA analysis concluded that none of these would have been prevented by requiring certification tests on wet runways.

The ALPA contention that FAA have ignored their requests for development of wet runway requirements is not valid. For many years the FAA have conducted studies and research programs in an attempt to develop methods for determination of friction characteristics of various runway surfaces. They have conducted many tests with NASA and the U.S. Air Force using various jet transports on wet runways and various friction measuring devices in an attempt to correlate runway friction to airplane stopping capability on wet surfaces. They have drafted several versions of proposed rules using these methods which would require testing on wet runways. The proposed rules have not been acceptable, however, because the correlation of friction devices to airplane stopping capability has not proven to have sufficient accuracy or repeatability for certification testing.

During these intensive efforts the FAA, ALPA, Airline personnel, and airplane manufacturer's have all participated, and all have been involved in the normal rule making process. Although these efforts did not produce a better certification method, a great wealth of useful data did emerge. Much was learned about wet and slippery runway performance and how to handle these variables in actual operations. This information has been made available, and today's airplane operations have benefited.

During one of FAA's test programs in 1971 on an extemely wet surface, it was determined that the 727 wheels could lock up under certain conditions. Boeing used this information to re-design and incorporate improvements in the 727 locked wheel protection system. This feature is a relatively minor change and is incorporated in all production 727 airplanes. Also the improved locked wheel protection system was made available for retrofit to all 727 operators in 1973.

The experience gained in these FAA programs also assisted the manufacturers in making other improvements in airplane systems to improve landing capabilities and relieve pilot work loads during critical phases of landings. Some of these are improved anti-skid systems, automatic landing systems, automatic spoilers, automatic brakes, & improved thrust reverser effectiveness.

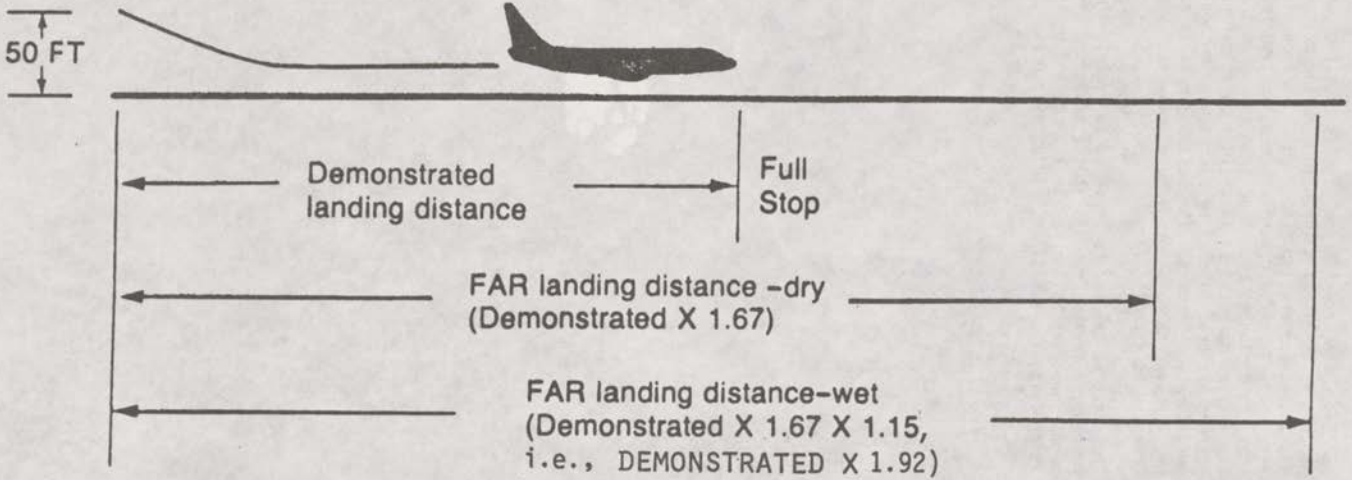
Another important determination resulting from FAA and NASA efforts during these programs is the finding that grooving of runways is a major factor in improving wet stopping capability. Tests conducted by FAA with a 727 on wet grooved runways showed that the stopping capability was nearly as good as on dry runways.

The manufacturers are well aware of the importance of training and educating pilots regarding operations on slippery runways. We support the development of procedures which recognize and report runway conditions to the pilots. We do supply guidance material for pilots regarding operational methods for coping with various runway surface conditions. One example of this type of guidance material is an article entitled "Landing on Slippery Runways" which was published in the Boeing Airliner magazine in January 1978.

In conclusion, the AIA position is that the current FAA certification process is still valid for determination of the operational landing distances, and development of additional certification rules is inappropriate until there is clear evidence, derived from flight safety records, that the distances resulting from the present regulations are inadequate. The extreme operational variations which may not be covered by the current factors are best handled by operational methods rather than by the certification process. The best universally accepted solution for the wet runway problem is grooving of runways. We would recommend that runway grooving be expedited.

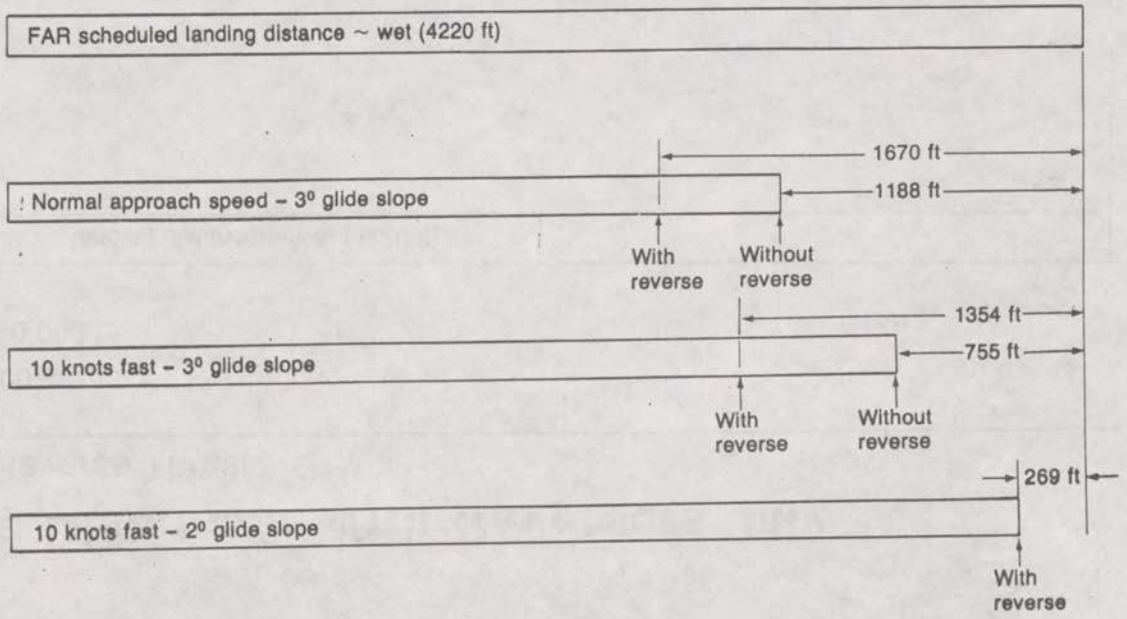
The attached charts are provided to explain the current certification procedures for wet runway landing distances and to show that considerable operational variations can be accomodated by the factors applied when determining the scheduled landing distances.

FAR Landing Distance



Wet Landing Distances With Operational Variations

Adv 737-200
Weight = 90,000 lb

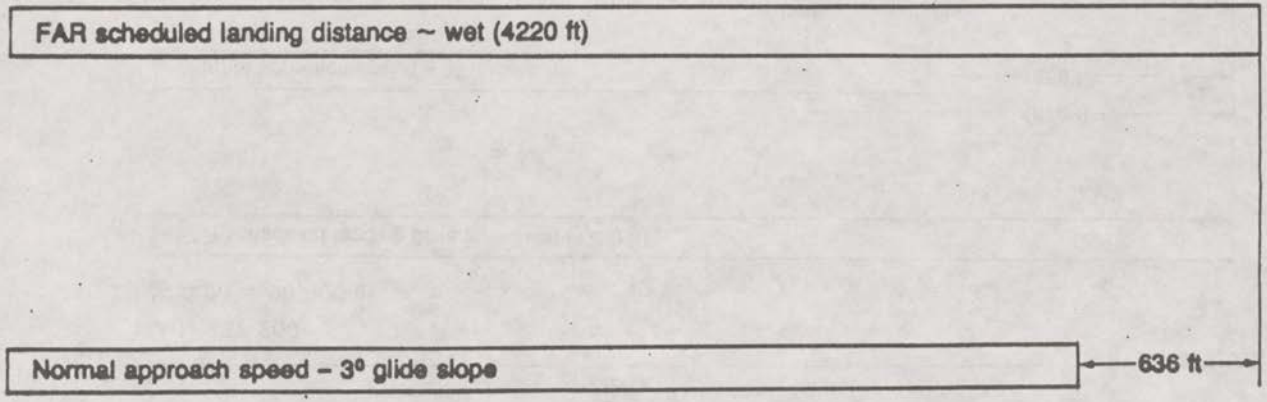


Landing Distances With Reversers Only

Maximum Reverse Thrust

Adv 737-200

Weight = 90,000 lb

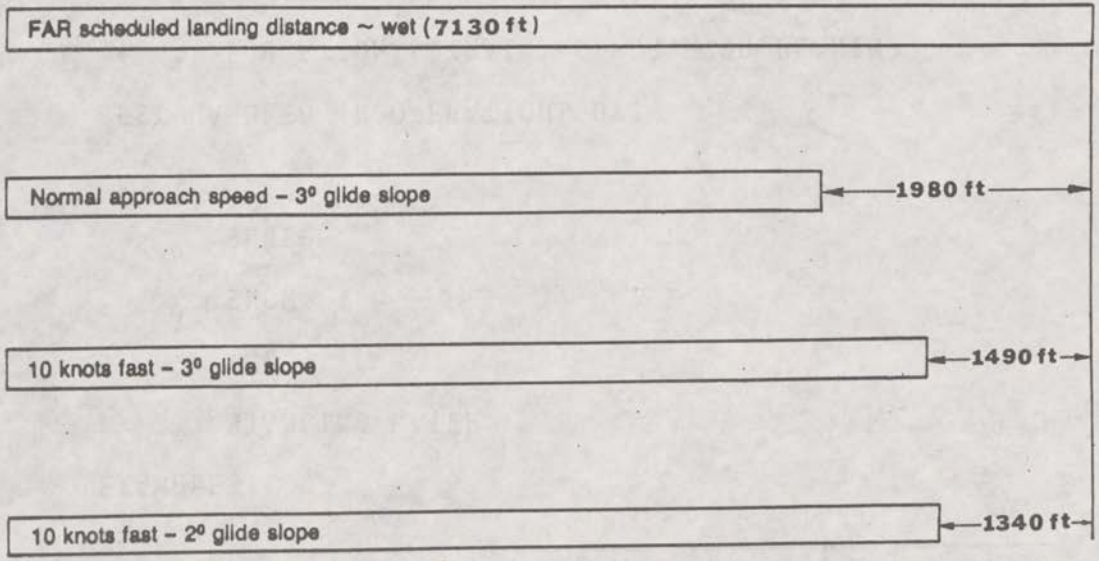


Wet Landing Distances With Operational Variations

No Reverse Thrust

747-100

Weight = 564,000 lb



EXTREME OPERATIONAL VARIATIONS

EXAMPLES:

- STANDING WATER
- ICE
- SNOW
- SLUSH

BEST HANDLED IN OPERATIONS BY:

- EDUCATION & TRAINING FOR HYDROPLANING
- DEVELOPMENT & IMPLEMENTATION OF PROCEDURES FOR REPORTING RUNWAY CONDITION TO PILOT
- PROVIDING GUIDANCE TO PILOT REGARDING OPERATIONAL METHODS TO COPE WITH SURFACE CONDITIONS

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CONCLUSIONS

- CURRENT FAA CERTIFICATION PROCEDURES ARE VALID
- EXTREME OPERATIONAL VARIATIONS (SUCH AS ICE, STANDING WATER) ARE BEST HANDLED BY OPERATIONAL METHODS RATHER THAN BY CERTIFICATION PROCESS
- RUNWAY GROOVING IS UNIVERSALLY ACCEPTED BEST WAY TO MINIMIZE WET RUNWAY PROBLEMS

CERTIFICATION OF FAIL PASSIVE AUTOLAND SYSTEM TO CATEGORY IIIa MINIMUM

U. S. manufactured air transport category aircraft have operated for some years with automatic landing systems. While the body of this paper will be directed to the 727 autoland system, the matter of automatic landing universally applies to nearly all jet transport models.

In order to put this matter in perspective it is appropriate to consider that the 727 "fail-passive" autoland system is a logical extension of the "ILS approach" system which is standard equipment in nearly every jet transport operating today. These aircraft and their systems are designed to operate under Category II weather conditions of 1200 feet RVR (Runway Visual Range)* --- meaning visibility

*An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end; it is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR is used in lieu of RVV and/or prevailing visibility in determining minimums for a particular runway.

a. Touchdown RVR - The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

b. MID RVR - The RVR readout values obtained from RVR equipment located midfield of the runway.

c. Rollout RVR - The RVR readout values obtained from RVR equipment located nearest the rollout end of the runway.

ICAO - Runway Visual Range - The maximum distance in the direction of takeoff or landing at which the runway or the specified lights or markers delineating it can be seen from a position above a specified point on its centerline at a height corresponding to the average eye-level of pilots at touchdown.

of one-quarter mile. A Decision Height/DH** of 100 feet is the minimum value employed. Decision Height means the altitude by which, and below which, sufficient visibility must continually exist to support a manually controlled landing, in the pilot's conservative judgment, or else a go-around, must be made and thus the landing aborted. These same concepts of minimum visibility values and Decision Height are retained for the new Category IIIA, 50-foot Decision Height, 700 RVR, certification.

The perfect safety record, over the years, with Category II operations is one essential ingredient for confidence in the safety of the extension of that type of operation to further reduced weather minimums. Another ingredient, and the substance of my remarks today, is the design characteristic of the 727 "fail passive" autoland system. Category II operations are routinely conducted with single autopilot with independent flight director system, or with dual autopilots, or with dual independent flight directors which have minimum capability to detect faults. The 727 autoland system has a very secure capability to detect faults and limit their effects to small values.

The Boeing design approach inherently provides a high level of safety for autoland operation and

safety criteria. An extensive set of data which confirms achievement of the design goals and the FAA requirement has been furnished to the FAA over the period of the last ten years. The data was developed

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**With respect to the operation of aircraft means, the height at which a decision must be made during an ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.

ICAO-Decision Height - A specified height at which a missed approach must be initiated if the required visual reference to continue the approach to land has not been established.

through computer simulations, reliability and safety studies and through actual flight tests on carefully instrumented 727 test aircraft. As may be imagined, many man-years of engineering effort have been expended in gathering, analyzing and preparing that data.

The accompanying illustrations portray the inherent safety by showing the consequence of operational variables.

All of the first four figures include a simplified illustration of the pilot's Attitude Director Indicator (ADI) in the upper right hand corner. One of these instruments is located directly in front of each pilot displaying much of the information required for "instrument condition" approaches. The Instrument Landing System (ILS) radio beam deviations are shown on the left and bottom sides of the instrument. All landing approaches under instrument conditions to low altitudes, fundamentally depend on the guidance information furnished by these ILS beams. This dependency applies to all approaches whether made by the pilot manually, or through a single channel autopilot in coupled approaches, or by fail-passive autoland systems (as the 727 or 747) or by fail-operational autoland systems as on some 747's or 1011's. These beams are installed on the ground and oriented such that, if followed, the aircraft will cross over the approach end of the runway approximately fifty feet above the runway and on centerline. Also shown on each of the four figures are a side view and a top view scene of an aircraft in the final phase of the landing approach. Only a portion of the runway is depicted.

(FIGURE 1)

The nominal performance for the 727 autoland system is illustrated in Figure 1. As the aircraft descends on a stable flight path through 100 ft. altitude above the runway (as is noted by reference to the radar altimeter instrument) the ILS beam deviations are zero. The autopilot continues to operate the pitch and roll controls to bring the aircraft to a touchdown, on centerline, approximately 1400 feet down runway. The pilot disconnects the autopilot, through a conveniently located button on the control wheel, shortly after touchdown. He performs the steering and braking of the airplane on the remaining runway.

(FIGURE 2)

A variation in system performance results largely by the influence of atmospheric winds and turbulence. The system has been certified for operation in winds of up to 25 knots headwind, 10 knots tailwind and 15 knots crosswind. The winds and other influences result in the touchdown point variation illustrated in Figure 2. If the ILS beam deviations, as the aircraft descends through 100 feet altitude, are less than or equal to the values shown in Figure 2; then the aircraft will touchdown within the hatched area shown. All things considered, this performance can be expected better than 95 percent of the time. Should the deviations at 100 feet be in excess of the "gate" values shown the pilot may elect to go-around or land manually. A manual landing would be accomplished only, if in his judgment, sufficient visibility and alignment exist. It should be noted that very extensive and bright runway lighting is installed at all 35 or so Category II runways at which the operations are performed to provide alignment and landing cues.

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The serious concern with safety in these operations is the effect of component failures. This is the reason for providing redundant sets of sensors (radio receivers, etc.) and autopilot computations. Fail-passive systems employ two complete sets of equipment that operate simultaneously. By design the effect of a fault is confined to a small departure from the normal flight path. Highly reliable automatic monitors continuously cross-check the two systems for any disagreement between them. If the disagreement exceeds a preset threshold, then both systems are automatically disengaged. When this happens, the pilot is alerted through flashing lights and a warning horn, and he takes over control of the trimmed aircraft.

(FIGURE 3)

The key to the design of a fail-passive system is to ensure that no fault or even improbable combination of faults, can cause a hazardous departure from the intended path, especially at low altitude. The consequence of a worst case faulted condition is illustrated in Figure 3. For any fault occurring below 150 feet or so, and assuming the aircraft lined up at 100 feet altitude, the aircraft will touchdown within the cross-hatched region shown in Figure 3.It is important to note that this cross-hatched region represents the "worst case" fault situation. That is, a case where the magnitude of the fault and its initiation point is such that fault detection does not occur until just as the aircraft touches down. All faults of lesser magnitude or later initiation result in touchdown well within the cross-hatched zone. All faults of larger magnitude or earlier initiation result in automatic disconnect before the aircraft flight path reaches the extremity

of the lines, in side and top view scenes, leading to and encompassing the cross-hatched zone. Again, it should be stressed that the cross-hatched zone is the "worst case" faults. These, of course, are highly improbable, but nevertheless they are the basis for assuring inherent safety through design.

(FIGURE 4)

In Figure 4, the normal performance variations of Figure 2 are combined with the "worst case" fault effects of Figure 3 to give the net resulting aircraft touchdown for highly improbable faults under conditions of wind and turbulence. In summary, if the aircraft has been tracking the ILS beams and passes through the "gate" at 100 feet with ILS deviations less than or equal to the values indicated on the Attitude Director Indicator, then complete assurance exists that the airplane will either touchdown within the confines of the runway, or the autopilot will automatically disengage before these confines are exceeded.

(FIGURE 5)

The 727 go-around performance is illustrated in Figure 5. An altitude loss of 15 to 25 feet, depending on pilot technique, will be experienced between the time go-around is initiated and the moment the aircraft is at minimum altitude. Thus, for go-arounds initiated at the 50 foot decision height, touchdown will not occur. For go-arounds initiated well below the 50-foot decision height, either because visibility deteriorates or automatic disengagement occurs, momentary touchdown may take place. However, recalling that the aircraft in all cases is flying within the confines of the runway, there is no hazard. For

all go-arounds in low visibility, the pilot reverts back to the use, principally, of information on the Attitude Director Indicator (ADI). A command bar, driven by the flight director system which is entirely independent of the autopilot, provides pitch and roll reference information to be used in the go-around.

This concludes my remarks on the design approach for the 727 fail-passive autoland system.

(FIGURE 6)

A few words on the operational experience that exists with the 727 system are in order. The 727 system, certified for Category II operations with a 100-foot decision height, has been in service for ten years. Approximately seventy-five thousand landings had been made with the system before any reduction in decision height or visibility were made potentially possible by the recent FAA regulation pertaining to the 50-foot decision height. As stated earlier, virtually all jet transports are certified to operate to 100-foot decision height with autopilots and flight directors which rely entirely upon the pilot to detect faults and to perform the landing touchdown. The 727 autoland system which has been extensively tested, in service, represents a significant step forward in providing additional safety for operations in low visibility conditions.

In conclusion, for all the above reasons, The Boeing Company unreservedly endorses the FAA's new Category IIIa certification category for fail-passive systems on aircraft as the 727. Thank you for the opportunity to speak to you on this matter.

727 AUTOLAND SYSTEM NOMINAL PERFORMANCE

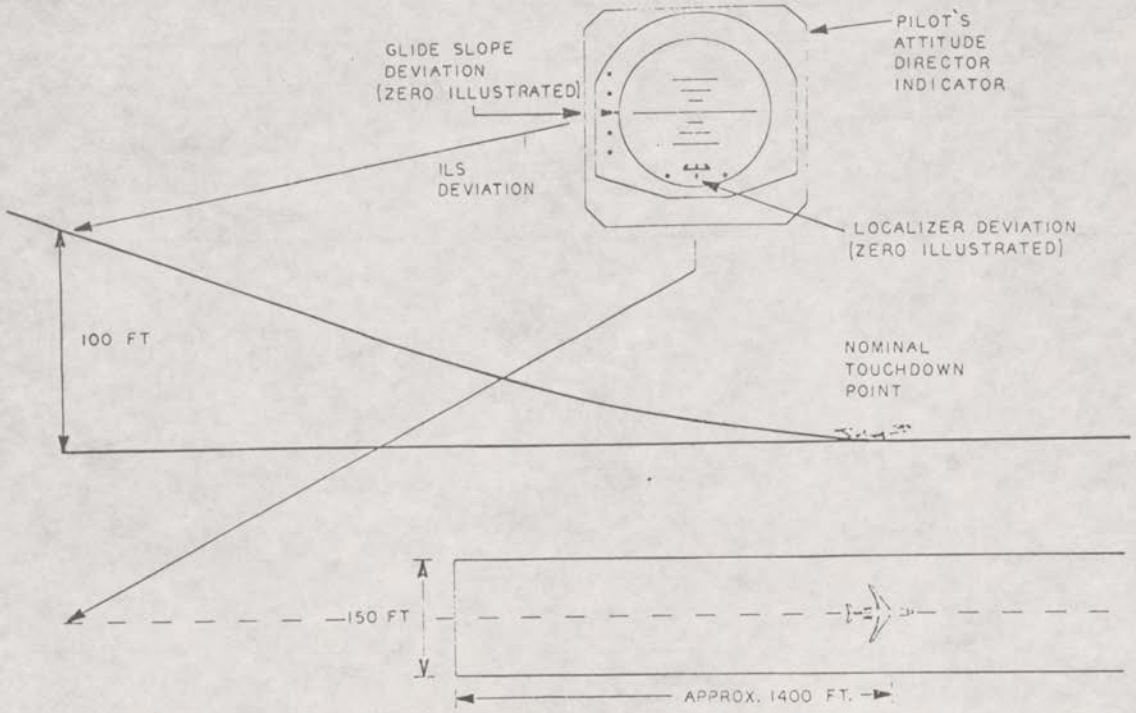

FIGURE 1

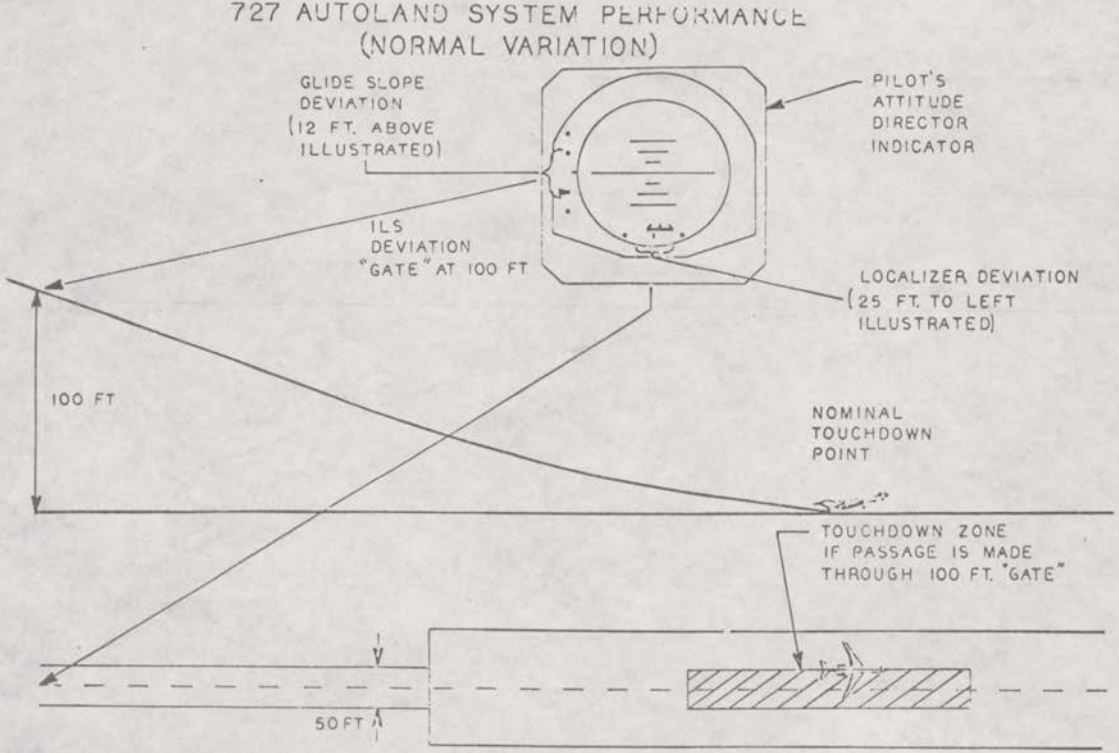
727 AUTOLAND SYSTEM PERFORMANCE
(NORMAL VARIATION)
GLIDE SLOPE DEVIATION (12 FT. ABOVE ILLUSTRATED)
PILOT'S ATTITUDE DIRECTOR INDICATOR
ILS DEVIATION "GATE" AT 100 FT
LOCALIZER DEVIATION (25 FT. TO LEFT ILLUSTRATED)
100 FT
NOMINAL TOUCHDOWN POINT
TOUCHDOWN ZONE IF PASSAGE IS MADE THROUGH 100 FT. "GATE"
50 FT

FIGURE 2

727 AUTOLAND SYSTEM PERFORMANCE (WORST CASE FAULTED CONDITION)

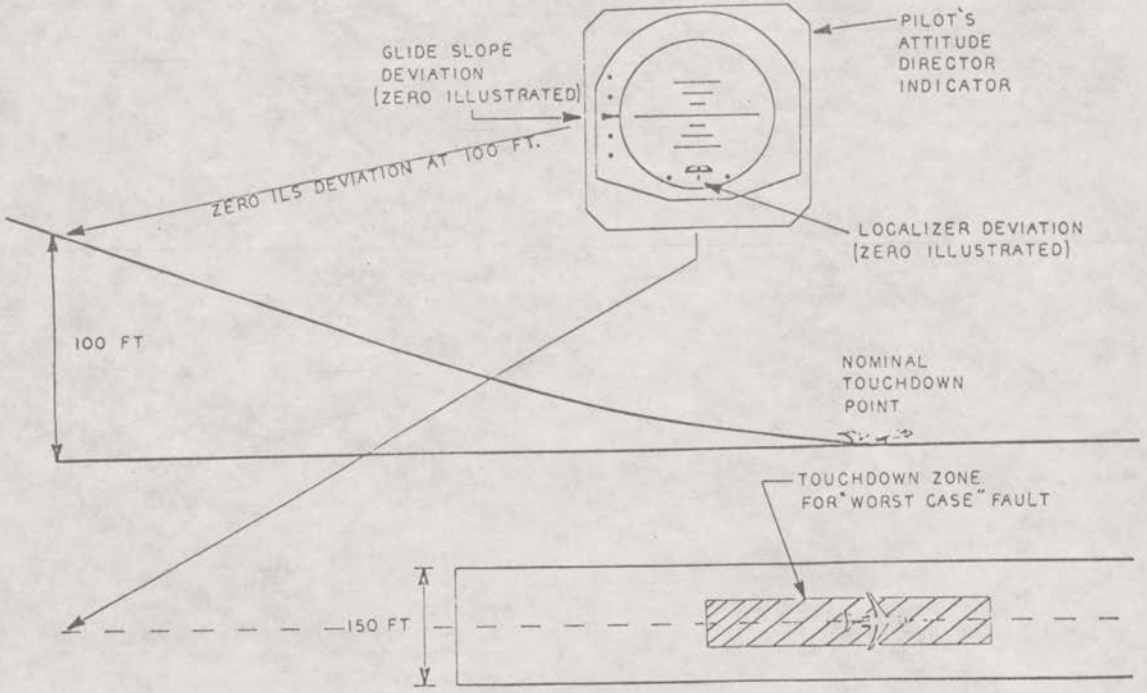

FIGURE 3

727 AUTOLAND SYSTEM PERFORMANCE
(FAULTED CONDITION WITH NORMAL VARIATION)

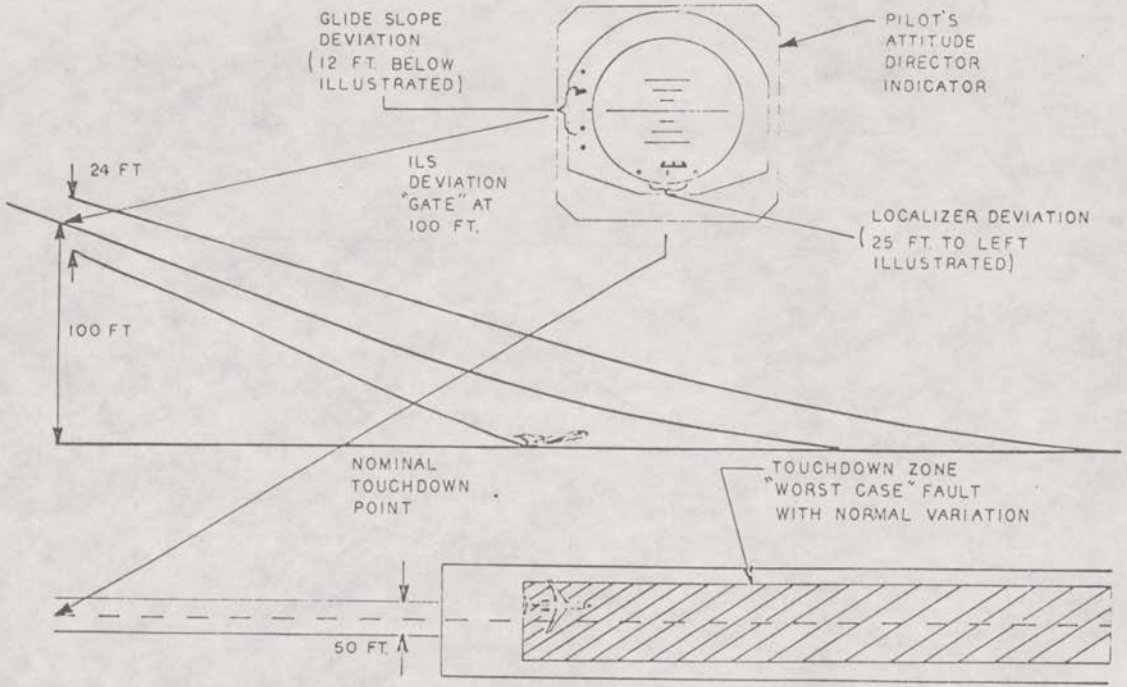

FIGURE 4

727 GO-AROUND PERFORMANCE

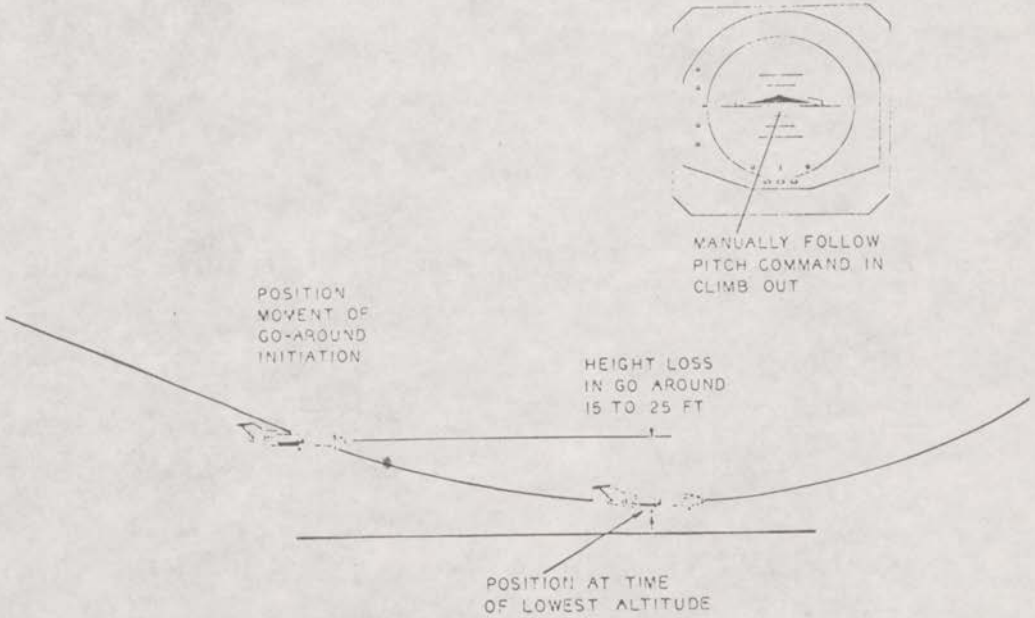

FIGURE 5

727 AUTOLAND EXPERIENCE

- CERTIFICATED TO CAT II IN 1968 (100 FT. DECISION HEIGHT)
- OVER 100 SYSTEMS DELIVERED BETWEEN 1968 AND PRESENT
- APPROXIMATELY 75,000 AUTOLANDS PERFORMED IN USA BY AIRLINES TO DATE
- NO HAZARD OR ACCIDENT HAS BEEN KNOWN TO ARISE IN SERVICE
- CERTIFICATED TO 50 FT. DECISION HEIGHT IN 1976

FIGURE 6

AIA POSITION ON COLLISION AVOIDANCE SYSTEMS (CAS)

- General aviation aircraft are the principal threat with regard to in-flight collisions. Hence, any system adopted must be effective for them.

- Approximately 10 years ago, the ATA developed CAS standards based on actual flight testing of three different systems. From this experience, an ARINC Standard was adopted in 1970. This Standard was never implemented, because the system could recognize only aircraft similarly equipped with CAS and this required installation of CAS equipment in all aircraft. It was determined that the cost would be prohibitive to general aviation aircraft.

- We would encourage the FAA to develop and adopt Standards for a full Separation Assurance System, including not only CAS but also air corridor separation, approach pattern spacing, etc. Such a system is increasingly feasible utilizing DABS/ATARS/BCAS and other technology developments.

- Whatever Standard is selected it must be compatible with an ATC system exercising total control over all vehicles in air spaces occupied by air carrier aircraft.

- This subject is currently under review by the FAA in the consultative planning conference, committee one and four.

AIA POSITION ON DC-10 CARGO DOOR

- The mandatory directive referred to in the pilots union statement, page 11, refers to what is commonly called an "Airworthiness Directive." The contents as discussed between the FAA and Douglas on this AD covered the following key points:
  - Fleet inspection
  - Placards installation (S. B. A52-35)
  - Viewing window (S. B. A52-35)
  - Latch actuator wiring (S. B. 52-27)
- If there was a "gentleman's agreement" between the FAA and the manufacturer it was to accomplish the above items on an expedite basis.
- The record clearly shows that this program was completed in a 30-day time period on all delivered DC-10's and effectivity issued for incorporation into production aircraft. This performance of rapid incorporation clearly eliminated any AD action by the FAA and was done at the cooperation of the manufacturer and the airlines.
- The Turkish accident did not occur because of any "gentleman's agreement." All of the above described items were properly incorporated.

AIA POSITION ON DC-8 GROUND SPOILERS

- The DC-8 Wing Spoiler System is designed for ground use only and thrust reversers are used for deceleration or descent in flight. However, during the certification process the spoilers were extended in flight to demonstrate the structural integrity of the system and controllability of the aircraft in flight with spoilers extended. This successful in flight demonstration also included a landing.

- The operation of the DC-8 spoiler system is controlled by a spoiler handle extending up radially from the control pedestal. In the stowed position the handle is forward of the vertical such that "raising" the handle along its radial requires both an up and forward motion. To arm the spoiler system for landing it is necessary to raise the handle from its stowed position approximately 1" up along its radial. Spoiler actuation occurs when the handle is moved aft from the armed position. On the early DC-8's the spoilers were automatically extended by compression of the nose gear strut, moving the handle aft. An override feature was provided, in case the automatic system failed, that permitted the pilot to manually move the spoiler handle aft and obtain spoiler extension. To prevent inadvertent actuation the force required to move the handle aft manually was set at 84#. In later versions of the DC-8 automatic actuation of the spoilers was accomplished by the "spin-up" of two or more main gear wheels from landing touch-down and the force required for manual override, in the case of automatic system failure, was reduced to a more modest 38#.

- Inadvertent extension of the spoilers was prevented by requiring an arming action distinctly different from the action required for spoiler extension, and by requiring an excessive pilot force to manually override the system and move the handle aft to the spoiler-extend position.

- The ALPA DC-8 evaluation committee on page 6 titled study items; 11 - controls adjacent to the throttles stated "the arrangement of controls adjacent to the throttles was satisfactory."

- All DC-8 flight crew manuals and training materials clearly indicated that the use of spoilers was not permitted in flight.

- In July, 1970, after eleven years of successful DC-8 fleet operation, a pilot-commanded manual extension of spoilers on approach ignoring past training thereby causing a fatal accident to an Air Canada aircraft in Toronto. In December 1970, the FAA issued AD 70-25-02 which required installation of a cockpit placard which read "DO NOT OPERATE SPOILERS IN FLIGHT". In February 1974 Douglas issued Service Bulletin 27-251 which offered DC-8 operators no-cost retrofit kits that provided in-flight lock-out of the spoilers. The FAA made this the subject of AD 7404-02.

GROUND PROXIMITY WARNING SYSTEM (GPWS)

The ground proximity warning system gives audible warnings to the pilot in five basic modes of operation:

Mode 1 - Excessive sink rate
Mode 2 - Excessive terrain closure rate
Mode 3 - Descent after takeoff (altitude loss)
Mode 4 - Inadvertent proximity to terrain
Mode 5 - Inadvertent descent below glideslope

In December 1974 the FAA issued an amendment to FAR 121 requiring the installation of a GPWS on each large turbine-powered airplane (turbojet and turboprop) used in operation under Part 121. This amendment also applied to air travel clubs certificated under Part 123 and to air taxi operators certificated under Part 135, when conducting operations governed by those parts with large turbine-powered airplanes.

The development of this ground proximity warning device to apply to all type jet airplanes, for the many modes of operation as noted above, was not an easy task. Development first started back in 1967 when an airline requested such a system on a 747. Special studies were initiated and specifications formulated.

Many developments, concepts, and system evolutions occurred between 1967 and the issuance of the FAR requirement in December 1974 as noted earlier. These developments involved many hours of flight testing on equipment suppliers, airframe manufacturers, and airlines airplanes. Flight testing of these type systems is very time consuming and by nature (pilot warning) very subjective and difficult to evaluate. The early systems were prone to nuisance warnings and not very effective. Pilots wanted to disconnect the system or ignore it.

In the Fall of 1971 a GPWS was certified on the DC-10. In the Spring of 1973, determined through flight testing, the voice command was added to the system to make it more effective. In October 1973 a GPWS was certified on the 707, 727, 737, and 747. Other key dates in the development cycle were: February 1974 added landing

flap logic to increase effectiveness to about 75 percent, July 1974 system changes made to reduce low altitude nuisance warning, and in August 1974 glideslope mode added (Mode 5 – Inadvertent descent below glideslope) to increase effectiveness to about 85 percent.

In September 1974 the FAA issued NPRM 74-32 requiring a GPWS on all large jet airplanes and asked for comments. After evaluating the comments received the FAA, in December 1974, made GPWS a requirement on all large jet airplanes by issuing an amendment to FAR 121 (FAR 121.360). Also starting in September 1974 there was considerable pressure on the FAA from Congress to take positive regulatory action in regard to installation of a GPWS.

A petition was made by the ATA to the FAA to provide relief until September 1, 1976 from the regulatory requirement for a GPWS carriage originally set for December 1, 1975. This petition was made because nuisance warnings, especially in narrow bodied jets, had assumed large proportions in airline operations and were creating operational problems. The minimum performance standards were revised to reduce this nuisance warning problem.

Future changes to the Ground Proximity Warning System can be expected that will further enhance the effectiveness of the system. These changes, as in the past, should be thoroughly developed, including an inflight service test, before they are incorporated into the basic system.

AIA POSITION ON HEAD-UP DISPLAY (HUD)

- HUD was originally developed for fighter aircraft weapons delivery. Current fighter aircraft HUD systems incorporate flight guidance data to aid the single pilot in weather landings.

- Until recently, HUD optics-system geometry requirements could not fit within transport aircraft cockpits without impairing pilot overhead clearance and pilot viewing angles. Even today it is not feasible to retrofit available HUD to some existing aircraft because of geometry requirements.

- There is no consensus between pilots or in industry on a standardized HUD presentation or the control laws necessary to produce the data. This is especially true in respect to guidance in wind-shear landing approach conditions.

- Douglas Aircraft and Boeing are vigorously pursuing HUD development and are under independent FAA contracts to Stanford Research Institute in HUD development.

- Douglas Aircraft is developing the first commercial transport with an FAA certificated HUD system. The DC-9-80 will be manufactured with an FAA certificated HUD system as an option. However, airline operators and manufacturers do not consider HUD a panacea to weather approaches and are concerned that pilot over-reliance on HUD may impair safety.

AIA POSITION ON SUPPLEMENTARY STALL RECOGNITION SYSTEM (SSRS)

- Modern aerodynamic design is so "clean" that natural stall warning within the definition of the FAA regulations, or stall characteristics, do not occur and it has been accepted practice to provide artificial warning to the flight crew. To satisfy Douglas and the FAA, an SSRS warning system was designed for the DC-9-30 that provided both a visual and audio signal at stall speed that would be unmistakable to the pilot. This system was evaluated by both the FAA "Blue Team" and the ALPA DC-9 evaluation team and found to be satisfactory. The ALPA comment on the system is reprinted below:

  ALPA DC-9 EVALUATION REPORT PHASE II, DATED 19 JULY 1967

  "This Phase II Report contains a number of items which are quite brief. The reason for this is that attached to this report is a DAC paper titled "DC-9 Series 30 Flying Qualities" which has been reviewed by the entire committee and they are in concurrence with its content. The committee feels it is not necessary to repeat those items which are reported in the DAC paper and has limited its input to those items which may not be in the DAC Report or which require attention.

  "The DC-9 Committee was very favorably impressed with the SSRS, and also the conventional recovery from stall. The ALPA DC-9 Committee commends Douglas for their solution to the stall problem associated with "T" tailed aircraft."

- This high praise for the DC-9 by the pilots union evaluation committee hardly gives credence to the testimony given at this hearing. Notwithstanding the ALPA evaluation team's position, after approximately six years of service DAC issued Service Bulletin 34-110 dated 6-23-73 and revised 11-7-73 which lowers the noise level of the horn. This action was not included in the pilots union testimony.

USE OF DERs

Submitted by Aerospace Industries Association of America, Inc.

Use of employees of an applicant to act in behalf of the government in accordance with guidelines established by the government has come under question many times over the past thirty years. Such activity involves designees who are involved with the airworthiness of aircraft, the quality of flight operations, the competence of airmen and the adequacy of flight procedures.

Although designees are involved in all of the above four areas, only the use of designees by an aircraft manufacturer has been questioned. The FAA published an executive summary in August 1974 entitled "Report on Actions to Redirect the Flight Standards Regulatory Mission, Functions and Activities August 1974". Page 4 of that report includes the following:

> "About 1,800 private persons are designated as agents for the Administrator. They conduct about 60,000 original airman certification actions annually, or about 90% of all actions. Another 1,000 private persons conduct most of the engineering/airworthiness actions. If we did not use these delegations, Flight Standards would require about 1,200 more employees."

It is interesting to note that of the 2,800 private persons listed above, 1,800 conduct airmen's certification actions.

Questions recently posed by the Airline Pilots Association to several members of Congress include a concern about the use of DERs (Designated Engineering Representatives). These submittals by ALPA also cover DMIRs (Designated Manufacturing Inspection Representatives), although the term DER is used for both. ALPA does not question the use of the 1,800 designees involved in the review of pilot competence. A negative premise is introduced by ALPA, i.e. "one of the basic deficiencies in the present system is the use of DERs by FAA". For purposes of this presentation we will ignore the phrase, "deficiencies in the present system" as the DER system is of significant benefit to the public and does not represent a deficiency.

The DERs accomplish the major percentage of approval activity related to FAA approval of a transport airplane. What is rarely emphasized, however, is that the FAA retains approval authority for all significant aspects of certification such as the regulatory basis for the certification, the analytical criteria to be used, the major design philosophy affecting safety, all safety analyses, all test proposals, all major test witnessing, and the major flight testing. They also retain authority over all in-service safety problems. The DER performs the detailed review of the thousands upon thousands of pages of analysis which prove the detail design of the airplane. It must be clearly

understood that the concepts and criteria upon which the detail design is based is FAA-, not DER-approved, and, the safety analyses, ground testing and flight testing which serve as final proof of the detail analysis is FAA-, not DER-approved. Further, FAA audits those approvals which the DERs are authorized to grant as a means of ensuring the acceptability of the DERs activity.

The public interest is ensured by the FAA's retention of approval of the significant aspects of aircraft certification. Were FAA to retain review authority over the secondary data which is now reviewed by DERs, it is obvious that the FAA's ability to concentrate upon the significant safety aspects of certification would be seriously diluted. As dilution of FAA's primary task is not in the public interest, replacement of DERs with FAA personnel would require the employment of hundreds of new FAA Aerospace Engineers at public expense. In order to perform what was the DER task, these new government aerospace engineers would be required to work at the manufacturer's facility on a full time basis so that they are as aware as the DER of the thousands of details involved in their particular specialty. This awareness can only be obtained through participation or observation of every detail of their specialty as the design develops.

The government currently enjoys significant benefit from the DERs, in that the DER serve as a contact for his counterpart government aerospace engineer. The government engineer can readily receive periodic detail updatings of his areas of concern via meetings with these DERs without the several hundred hours of research that would be required were the DERs not available for such contacts.

Somewhere along the line, one may question why the manufacturer is willing to pay the salaries of personnel performing a government function. The answer is quite simple. The utilization of DERs by a manufacturer allows the manufacturer to schedule the certification program and delivery of his aircraft with a degree of accuracy that would not be possible if these individuals were involved with several companies' projects at the same time. DERs work as many hours as are required to accomplish their review. FAA works a 40-hour week. Were FAA to handle all certification activity, there could be no assurance that a problem with another manufacturer's product would not divert FAA's attention to that of the other manufacturer to the detriment of the first manufacturer's schedules.

Integrity, by its definition, is based upon the background of the individual and not the salary that he earns or the source of that salary. The Designated Engineering Representatives are chosen mutually by the manufacturer and the FAA with specific qualifications in mind. These qualifications include the selection of individuals with the highest level of integrity and technical excellence. They must be intimately familiar with the Federal Aviation Regulations and with the design that they will be expected to review. They have a position in the employer's organization with sufficient authority to enable them to administer the pertinent regulations effectively.

The accident rate as reported by NTSB of U. S. manufactured aircraft attributable to the aircraft is admirably low. This extremely low accident rate is attributable to the positive efforts of the manufacturer, the DERs and the FAA. Of those few accidents that have occurred during the past twenty years which were not caused by cockpit crew error, we are unable to single out any accident which was caused through the negligence of a DER. Why then do we even question the advantages of, and more so, the integrity of these DERs?

As a matter of interest, it is worthwhile to note that if an FAA aerospace engineer is sued as a result of an accident or incident, the FAA is responsible for the defense of that individual. A DER who performs a negligent act is responsible for that act as an individual. Under these circumstances, one must question any argument that indicates that DERs will not treat an evaluation at least as honestly and professionally as would his FAA counterpart.

DERs consider their task to be a privilege granted to them by the government and one which reflects a trust in them by both the government and the manufacturer. This trust, and their integrity, are partially responsible for the success of the necessary government/industry association which results in the admirable U. S. transport aircraft safety record recorded by the NTSB.

What, then would result from deletion of the DER system?

1. A significant increase in FAA's personnel.

2. A significant increase in FAA's budget.

3. A reduction in the visibility of the day-to-day evolution of the design now available to the FAA through DERs.

4. Significant hazard to the certification of and delivery schedule of transport aircraft due to the unavailability of government personnel on a seven-day basis.

Appendix 3.—FAA Submission

1. General Electric CF6 Engine

ALPA issue: Evidence accumulated by a special investigations subcommittee of the House Interstate and Foreign Commerce Committee revealed a critical breakdown in the airworthiness certification process as administered by the FAA.

FAA response: Considering the House subcommittee report and based on FAA responses contained in this paper on the various issues raised by ALPA on the CF6 engine, this ALPA contention cannot be justified.

ALPA issue: In January of 1970, the FAA certificated the CF-6 engine as "safe." Despite the fact the engine had new technology that advanced the state-of-the-art by several stages, a five-year-old and, as it turned out - unsatisfactory - certification standard was applied to the engine under the "special conditions" authority vested in the FAA. Special conditions basically allow manufacturers to set their own certification standards if they can provide to FAA a satisfactory design and engineering basis for an exception to existing rules.

The company sought special conditions for certification of its new engine with drilled-tip blades, which had never been used before, based on the FAA's earlier certification of the Pratt & Whitney JT9D engine, which powers most Boeing 747s. The JT9D was the first high-bypass-ratio engine to enter commercial service.

FAA response: It is incorrect to indicate that special conditions allow manufacturers to set their own certification standards. Special conditions are airworthiness requirements that are issued when the FAA finds that the applicable airworthiness regulations do not contain adequate or appropriate airworthiness standards because of a novel or unusual design feature. Special conditions consist of such safety standards as are necessary to establish a level of safety equivalent to that intended by the applicable regulation Special Conditions No. 33-9-EA-4 were issued to the General Electric Company on June 6, 1969, for type certification of the Model CF6 engine. The novel or unusual features for which these special conditions were issued were related to hotter surface areas, higher turbofan inertia, higher compressor pressures, and a different idle power operational technique of the CF6 engine in comparison to previously certificated low bypass ratio turbofan engines. The feature of drilled fan blades was not considered to be novel or unusual with respect to the applicable airworthiness regulations; therefore, the special conditions did not address the drilled blades. The special conditions issued for the CF6 engine are contained in Docket No. 9644 which is open to the public for viewing.

Contrary to the allegations made by ALPA, General Electric did not seek to have these special conditions based on standards devised for the Pratt & Whitney JT9D engine. Instead, since the unusual features of the CF6 engine were comparable to those of the JT9D engine, the FAA applied the same special conditions for certification of the CF6 as for the JT9D engine.

The vehicle for "exceptions" to existing rules is the "exemption" which is issued on a showing by the applicant that the non-compliance has no adverse effect on safety and is in the public interest. There were no exemptions issued for the CF6 relevant to foreign object ingestion testing or to any other facet of certification.

ALPA issue: The FAA bowed to the manufacturer's economic arguments and did not employ the most current and stringent technical standards when it certificated the CF-6.

FAA response: The original certification basis of the CF6 series engines was FAR part 33, with amendments 33-1 through 33-3 thereto, and special conditions No. 33-9-EA-4. FAR Part 33 contained general foreign object ingestion test requirements; however, advisory circular 33-1A, which was in effect at that time, described acceptable means of conducting such tests.

Advisory circular 33-1B was not in effect at the time GE submitted their test proposal and received subsequent FAA approval. Since 33-1B was not in effect, they would have no reason to present any argument, economic hardship or otherwise, for not using the procedures suggested by that revision. Since such an argument was not presented, the FAA obviously could not have bowed to that argument. Even though 33-1B was not in effect, it should be noted that the differences between it and 33-1A are not overly significant. The later revision would have required three additional medium birds, as shown below.

BIRD SIZE	CF6 TEST PLAN FAA Approved 4/10/70	AC 33-1A Adopted 6/19/68	AC 33-1B Adopted 4/22/70
Small	20	16	16
Medium	6*	10	13
Large	1	1	1

*NOTE: Six medium birds were fired at critical areas which were considered more stringent than random firing of 10 birds as specified in AC 33-1A.

ALPA issue: Despite findings by the House subcommittee, FAA declined to issue an Airworthiness Directive (AD) to replace drilled-tip blades with those of more conventional manufacture.

FAA response: The issue raised by ALPA relative to safety of the drilled-tip fan blades was reviewed thoroughly by the Staggers Special House Subcommittee on Investigations in 1974. The subcommittee concluded that, "a large number of qualified experts has now reviewed the background and characteristics of this (CF6) engine and pronounced it safe." The subcommittee based this conclusion, in part, on the interim reply of the National Transportation Safety Board (NTSB) in November 1974, which stated that, "the Safety Board does not believe

that the risks of engines with drilled fan blades are any higher than the risks of engines with solid fan blades . . . ." The NTSB's final report, dated March 7, 1975, concluded that "neither aircraft airworthiness nor individual passenger safety is compromised by the use of drilled fan blades in the CF6 engine." These conclusions justify why the FAA did not not issue an airworthiness directive to have the drilled fan blades replaced with solid fan blades.

ALPA issue: FAA failed to require adequate testing of the CF6 engine for operating in icing conditions.

FAA response: Following initial testing in 1969, with respect to FAR 33 requirements for operation in icing conditions, the FAA advised GE that the tests did not demonstrate total compliance with FAR 33 (reference FAA letter dated January 23, 1970). GE subsequently conducted supplemental testing in February of that year. The FAA then found that the original testing plus the supplemental testing together demonstrated compliance with Part 33.

The tests were conducted at General Electric's Peebles, Ohio, ground test facility under carefully contolled conditions. The ALPA assertion that test aircraft did not penetrate known icing conditions for any length of time at all in certification tests does not refer to CF6 engine certification since flight tests were not used to substantiate the engine, but for certification of the DC-10 airplane where the center engine suffered minor damage after ingesting ice of airframe origin during airplane certification flight tests. The DC-10 was certificated after modifications were incorporated to prevent ice accumulation on the affected airframe areas.

ALPA issue: FAA did issue an Airworthiness Directive (AD) on the CF-6. The AD, however, did not call for a fix of the engine. Rather, it called for protection of fuel lines and other control conduits on the DC-10, particularly to the No. 2, or tail-mounted engine.

That AD, issued August 23, 1974, provided only that the main fuel line to the tail engine of the DC-10 be shielded on GE-powered aircraft. Less than two months later, on October 15, the original AD was amended to provide special shielding was necessary only on GE-powered DC-10's with drilled-tip compressor blades.

FAA response: AD 74-18-17 was issued on August 23, 1974, to require shielding of the fuel line in the No. 2 engine position of all CF6 powered DC-10 aircraft. Because the CF6 solid fan blades do not exhibit fragmentation characteristics similar to the drilled fan blades when damaged by foreign objects, that AD was amended on October 15, 1974, to apply only to DC-10 aircraft incorporating a drilled fan blade CF6 engine in the tail location. It is noted that the aircraft fuel line protection provided by AD 74-18-17 was considered in arriving at the conclusion that the drilled fan blades provide for an acceptable level of safety. It should also be noted that when a fragment from a drilled blade was released it generally caused damage to other

blades. Although this secondary damage was not considered a hazard to the airplane, it did become an economic burden to the operators. GE, therefore, switched to solid type fan blades for subsequent production to alleviate the cost of repairing this secondary damage.

ALPA issue: On November 12, 1975, an Overseas National Airways DC-10 began its takeoff roll at John F. Kennedy Airport. Midway down the runway, the DC-10 encountered a flock of gulls feeding from a nearby garbage dump. One of the plane's wing-mounted engines - not the high, tail-mounted engine that was the subject of the FAA's two airworthiness directives -- ingested some of the flock. Its drilled-tip blades disintegrated into shrapnel that blasted through the engine shroud and into the wing and fuselage. Portions of the disintegrating engine ripped through fuel lines causing jet fuel to ignite. The pilot ultimately fought the blazing aircraft to a halt off the end of the runway. His actions allowed the 139 passengers to escape, but the DC-10 was consumed by fire.

FAA response: Fragmentation of drilled fan blades was not a factor in the Overseas National Airlines accident as alleged by ALPA. During the investigation of this engine failure, it was found that severe unbalance resulting from a blade failure inboard of the mid-span shroud would abrade the epoxy booster stage liner into a fine powder. Under certain conditions of temperature and pressure, the combustion of this powder caused a rapid over-pressure and splitting of the compressor case. When the compressor case was split in the accident, the fan assembly separated and the fuel supply line in the leading edge of the pylon fractured, expelling about 40 gallons of fuel before the fuel shutoff was actuated and fire erupted on the right wing. When the aircraft was turned onto a taxiway, the right main landing gear failed resulting in wing fuel tank fracture which allowed additional fuel to be added to the fire. Whether drilled or solid fan blades were used was irrelevant since the failure had to be inboard of the mid-span shroud in order to produce the required unbalance. The drilled and solid fan blades are the same in this area. AD action was subsequently taken to remove the epoxy material from the CF6 engines.

It should be noted that the birds involved in the ONA accident were large birds. As noted above, the variation from the test procedures suggested by Advisory Circular 33-1A during the original certification program involved only medium size birds. This variation was, therefore, totally irrelevant insofar as the ONA accident was concerned.

ALPA issue: Among the six recommendations the NTSB issued on the CF-6 engine were that the FAA "increase the maximum number of birds in the various size categories required to be ingested into turbine engines with large inlets. These increased numbers and sizes should be consistent with the birds ingested during service experience of these engines."

The FAA has not yet acted on the last recommendation of the NTSB. Action was withheld pending the agency's Engine Regulatory Review Program. Results of that program have not yet been made public.

FAA response: The NTSB recommended (A 76-64, April 1, 1976) that the maximum number of various size birds which are required to be ingested into turbine engines with large inlets should be increased to be consistent with the birds ingested during service experience of these engines. This recommendation was presented as Proposal No. 101 in the Engine Regulatory Review conducted by the FAA during January 16-19, 1978. Proposals by ALPA, FAA, and other organizations to amend the bird ingestion requirements were also presented at the Engine Review. It was noted at this Review that reference to "bird ingestion during service experience" in the NTSB recommendation was rather vague for rulemaking purposes since numbers and sizes of birds ingested in service cannot be readily determined. Other comments related to the bird ingestion proposals are under consideration for the preparation of a Notice of Proposed Rulemaking which is expected to be issued later this year.

2. Wet Runway Performance

(a.) Current Certification Standards

ALPA issue: Current certification standards require that aircraft be tested only on dry runways. Failure of FAA to require testing under such a common operating condition as a wet runway has been directly responsible for many accidents and incidents.

FAA response: ALPA is apparently referring to landings on wet runways. While it is true that current certification standards do not specifically require testing on wet runways, operating requirements of Part 121 do apply a multiplying factor (1.92) overall to jet transports to the landing distance determined during type certification tests on a dry runway.

The current regulations require all 121 operators to multiply the demonstrated dry runway landing distance by a factor of 1.67 for dispatch to a forecast dry runway. An additional 15% is required for dispatch to a wet runway. Thus, a 121 operator is required to dispatch to a wet runway which is 1.92 (or nearly twice) the demonstrated dry landing distance. In addition, no credit is given for the use of reverse thrust, thereby adding considerably to the margin.

Based on an ATA analysis of 98 incidents/accidents, only a fraction were due solely to wet or contaminated runway factors. Many of the incidents involved poor pilot judgement, hesitation, excessive approach speeds, veering off the side of the runway, etc.

It has been suggested that a better landing rule should be required, one that more closely represents the real operational factors involved, rather than arbitrary ratios being applied. However, the accident/incident data does not readily lead to the conclusion that a safety problem exists due solely to contaminated runways.

(b.) Hydroplaning on a wet runway and spoiler activation.

ALPA issue: That hydroplaning occurs while an airplane is touching down for landing and automatic activation of the spoilers is delayed requiring manual activation by the pilot and a longer stopping distance.

FAA response: FAA has been aware of this problem and has been actively pursuing its resolution. The best solution appears to be treatment of runway surfaces to improve the runway surface characteristics. To this end, a program has been established to provide federal funding assistance for surface treament of runways used in air carrier operations. As of September 15, 1978, there were approximately 172 airports with 243 grooved runways in the system. Also there are a relatively large number of runways currently undergoing grooving. It is anticipated that, in the next two years, at least one runway serving turbojet air carriers at approximately 164 additional airports will have grooved surfaces. The money for runway grooving is provided by the Airport

Development Aid Program (ADAP). In FY78 federal funds paid for 75 percent of the cost of grooving at medium and large hubs and 90 percent at all other air carrier airports. In FY79 federal funding remains the same for medium and large hubs, while at other air carrier airports, federal funding will be reduced to cover 80 percent of the cost. There is also a program to consider the use of runway surface friction measuring devices for assessing runway surfaces at air carrier airports to determine the need for runway maintenance or for improving existing runway surfaces. Currently, friction measuring devices are being used on a test basis at 26 air carrier airports.

The FAA is aware of the slowness of automatic activation of the spoilers on a wet runway. Generally, it can be expected that the pilot would be able to manually activate the spoilers within three seconds if the automatic system failed to operate. This would result in an increase in stopping distance of about 600 feet. The 1.92 factor applied to the dry landing distance was designed to account for this and other operational variables.

(c.) FAA Flight Test Handbook

ALPA issue: The adverse impact that wet runways have on aircraft performance and therefore on safety means that wet-runway performance should be included in the certification process. ALPA has recommended that several times in the past. In 1973, we told the FAA that its Flight Test Handbook, which tells manufacturers how to test their aircraft for certification, should include testing on wet runways. When the Handbook appeared, however, it contained no mention of wet-runway testing.

FAA response: The Flight Test Handbook is not regulatory. It is intended to give guidance on testing for showing compliance with the regulations. Therefore, if there is no regulation to test on a wet runway, guidance on such testing in the handbook would be inapropriate. The FAA has issued advisory material on determining landing distances on wet runways in connection with the operating rules which require application of a 15 percent margin or, alternatively, testing on a wet runway.

(d.) Airworthiness Review

ALPA issue: In 1974, we recommended to the FAA's Airworthiness Review a proposed rule covering aircraft performance on wet runways. So far, we have heard nothing; the FAA has neither acted on nor rejected our proposed rule.

FAA response: The ALPA did submit three proposals for wet runways accountability for the 1974-1975 Airworthiness Review. At the Conference held to discuss the various proposals, ALPA withdrew two of their proposals and retained only one dealing with the takeoff. As reflected in the minutes of the conference, the FAA concurred with the ALPA position that the immediate solution to the problem of wet and slippery runways is to take care of the runway surface, and the best approach is the grooving of runways. The ALPA also concurred with the Aircraft Industries Association that further discussion should be delayed until a rational landing distance criteria is more mature.

The remaining proposal to require wet runway accountability for the takeoff was deferred for consideration at the next Airworthiness Review because the problem was so complex and extensive that more time was needed for it resolution.

ALPA is incorrect in stating that sofar the FAA has neither acted on nor rejected its three proposals. As indicated above, ALPA withdrew two proposals, and the third one was deferred by the FAA. Announcement of the deferment was made in Notice 75-25 issued on May 29, 1975.

(e.) Flaws in Type Certification Procedure

ALPA issue, General: There are two serious flaws in the procedure of applying a 15 percent factor to a dry runway stopping distance to arrive at the wet runway distance.

First ALPA issue: The FAA does not define what a wet runway is.

FAA response: This is true. The problem is so complex that consistent results within reasonable limits of accuracy and testing have been difficult to obtain. It should be noted that the ALPA is not correct in stating that the 15 percent is applied to the dry runway stopping distance. In fact, the 15 percent factor is applied to a distance obtained by multiplying the overall landing distance determined during type certification on a dry runway by 167 percent.

Second ALPA issue: The agency allows the manufacturer to demonstrate shorter landing distances than required by the 15 percent rule. This is graphically illustrated by the Boeing 727. The company was able to convince the FAA that the 727 required only 7-8 percent more to stop on a wet runway, instead of the agency's estimate of 15 percent, and the aircraft was certificated for the shorter distance.

FAA response: ALPA contention of 7-8 percent is essentially correct. ALPA wants testing on wet runways, yet it does not want to accept the results when the outcome is shorter landing distances than the existing 1.92 distance.

(f.) FAA & NASA Testing

ALPA issue: However, later tests by the FAA and the National Aeronautics and Space Administration showed that the 727 on a truly wet runway far exceeded even the 15 percent margin. In some cases, the aircraft took about twice the dry-runway distance to stop on a wet runway. The reason is that brake application just after touchdown caused the wheels to lock. That in turn induced extensive hydroplaning, which led to the excessive runway stopping distance.

FAA response: It is true that, in FAA-NASA tests, the Boeing 727 required about twice the dry-runway distance to stop on a wet runway. The operational factor of 1.92 was ample to account for the relatively extreme conditions under which some of the landings were made. This appears somewhat to substantiate the factor of 1.92 that is required to be applied by the operating rules. (See also discussion under item (b) on hydroplaning and runway surface treatment.

(g.) Special Pilot Techniques

ALPA issue: The lack of wet runway standards in the certification process has resulted in pilots developing their own techniques to cope with the problem. There have been many incidents and accidents stemming from hydroplaning; that there have not been more is a tribute to the skill and experience of airline pilots, not to the FAA's certification procedures.

FAA Response: The FAA recognizes the wet runway stopping problem and continuing efforts are being made to address the problem. In this regard there is a program on grooving/surface treatment of runways. Also a study to require wet runway accountability for the takeoff and landing is in process. This study encompasses the analytical development of a set of rational takeoff and landing distance requirements. It also involves the use of runway surface friction measuring devices and application of an appropriate margin operationally.

Many of the incidents and accidents referred to by ALPA were due, at least in part, to the pilot landing too far down the runway and too fast.

FAA RESPONSE TO
ALPA'S SUBMISSION ON
ITEM 3: AUTOMATIC LANDING SYSTEMS

The charge that FAA's handling of the aircraft certification process with respect to automatic landing systems "has created aviation safety hazards" and the ALPA questions of whether "FAA's proposal will provide an adequate margin of safety" are based largely on misleading, incomplete, and in some cases, incorrect information.

Before considering details, a general distinction between the airworthiness certification process and an operational approval should be made. The charges that have been made frequently confuse these two issues.

The ALPA discussions of "Boeing data," "flight demonstrations," and "NAFEC tests" relate to the airworthiness certification of the B727 for CAT IIIa which was completed by the FAA on December 9, 1976. The basic airworthiness approval for the B727 autoland was made on June 22, 1966. At that time, the B727 met all the requirements which the FAA had specified for a system of this type. In fact, the system was later shown to also meet additional requirements which we placed on later generations of automatic landing systems.

The items related to crew qualifications, a 3-man cockpit crew, the use of specific operating procedures and other items such as these, relate to a fail-passive CAT IIIa "operational approval" for which FAA has yet made none. Criteria for such approvals is contained in AC 120-28B which was issued on December 1, 1977.

ALPA's Introductory Statement

The introductory statement of ALPA citing FAA's reasons for issuance of airworthiness and operations criteria for fail-passive systems is misleading. There is a long history of industry correspondence and discussion, of which ALPA is fully aware, which clearly show that there were many factors which contributed to FAA's publication of criteria for fail-passive CAT IIIa systems.

Summarizing a few reasons, as they have in the submission on automatic landing systems, neglects the most significant aspects of 10 years of intense FAA and industry activity which preceded the B727 airworthiness approval and the issuance of CAT IIIa fail-passive operations criteria. To name a few, at that time, FAA had already made CAT IIIa airworthiness approvals for three different aircraft types, three CAT IIIa facility approvals, several CAT IIIa operations approvals for airlines, and unofficial estimates had been made that 11 U.S. airlines had conducted over 10,000 actual CAT II approaches with 10 different types of aircraft. Four different types of aircraft were capable of automatic landings and a large number had been conducted in actual passenger service. All of this and other experience, of course, substantially contributed to the FAA's decisions on these matters.

French Experience

The statement that the French "have many mandatory aspects that are not found in the FAA proposal" is quite misleading. In fact, quite the opposite is true. From an airworthiness point of view, the single-channel Lear autopilot used by the French on the Caravelle for CAT IIIb operations probably would not even meet our stringent criteria used for the B727 for CAT IIIa (700 RVR), let alone CAT IIIb (500 RVR) as the French use it. Nevertheless it is significant that the French domestic airline at that time had conducted about 14,000 automatic landings primarily with this aircraft, of which approximately 1,400 were in CAT III weather as low as 500 RVR without accident or incident. This was done, it should be noted, with a system which probably wouldn't have met the FAA criteria for the B727, and without a head-up display (which ALPA has cited as necessary for such operations).

The use of autothrottles in the case of the B727 is an operations issue, not an airworthiness issue. In CAT II operations to a 100-foot DH, autothrottles are not required when making an autoland or when making a coupled approach disconnecting at decision height, and making a manual landing. The FAA does not believe there is any increase in workload and, in fact, it is more likely that there is a decrease in workload when operating in CAT IIIa with a 50-foot DH because in the CAT IIIa situation, the landing is automatic. Accordingly, it was not felt that mandatory use of autothrottles was justified.

Crew qualifications, procedures, and training for CAT IIIa are carefully established and closely monitored by FAA for all CAT III operations. There are no fundamental differences in this area between use of fail-operational or fail-passive systems. ALPA crews with three airlines have agreed with and, for some time now, been routinely flying U.S. CAT IIIa operations without problems related to these areas.

As for the 3-man crew requirement cited by ALPA, the B727 is already operated with a 3-man crew. Further, the crew complement is determined in the basic airworthiness certification process. The implication that operation of an aircraft in CAT IIIa weather conditions requires additional crewmembers beyond the complement specified at the time the aircraft is certified has no basis in fact.

As far as ALPA's claim that the "French procedures should be mandatory" if safety is to be assured, we will, as always, when an operational approval is considered for a fail-passive system, ensure that the procedures proposed for the operation will be safe.

Boeing Data

1. Go-Around. The meaning of ALPA's statement on go-around success is unclear. All of the aircraft the U.S. has certificated, whether using autoland or not, have safe go-around characteristics. In the case of the B727, these airplanes have also demonstrated safe go-around characteristics at low altitudes to touchdown.

2. 700 feet RVR and Conventional Cockpit Instruments. The value of 700 feet RVR is based on what the FAA considers to be the minimum RVR to ensure that adequate external visual reference will be available for the pilot to verify that the aircraft is in a position which will permit a successful landing in the touchdown zone. Regardless of the RVR reading, if the pilot, at any time after DH, should find that he does not have adequate visual reference to make this determination, the pilot is specifically required to miss the approach (discontinue the landing).

3. ILS 100% Reliability. The ALPA comment that FAA assumes that the ground system be 100% reliable is not true. No man-made system is likely to be 100% reliable. However, from the point of view of airworthiness certification, there is no difference between ILS reliability effects on a fail-operational autoland system (for which ALPA has never disagreed and which they routinely fly) and a fail-passive autoland. Both systems will respond in the same way to ILS ground system anomalies. It does not appear consistent to voice concerns on this subject for fail-passive systems, while at the same time agreeing that they are not of concern for fail-operational systems.

Regardless of this apparent inconsistency in the ALPA comments, all CAT III operations, fail-operational or fail-passive, are safe as they relate to ILS ground facility reliability. We provide for dual ILS transmitters on the ground so that if the primary one fails, the backup one can be switched on within 2 seconds. We have backup power and we have sophisticated monitoring circuits which detect if the primary transmitter is failing or if either system is not operating properly.

4. Complete Scientific Certification. As for ALPA's comment on the certification process, the FAA has used, uses now, and will continue to use, the best known scientific means to ensure that safety is met in certification. At the same time, FAA personnel have always attempted to ensure that impartiality, and objectivity is maintained in this process.

Industry Meeting

It is not apparent how or why a few selected items from a particular industry meeting in 1973 has any critical bearing on the adequacy of the FAA's certification process. There were many, many meetings, discussions, and presentations held over a 10-year period, of which there are numerous instances of pros and cons of issues being discussed and conclusions

being drawn which were later reconsidered, proved correct, or proved incorrect. The items here seem to be selected at random. Nevertheless, each of these items has been considered and resolved.

1. Fail-Passive Autoland and 10^9. The issue mentioned by ALPA relating to "10^9" refers to the use of a general reliability index considered when dealing with CAT III landing systems. Basically, it means that a general safety goal is set of less than one accident in a billion landings when using these systems for landing in bad weather. To put this number is perspective, it is over 100 times more conservative than various estimates which have been made at times for overall air carrier aircraft landings, or even for air carrier landings in good weather. As far as the B727 CAT IIIa system is concerned, it does meet the 10^9 landings/accident criteria cited by ALPA. However, ALPA is under the mistaken impression that this criteria must be met in isolation by the automatic landing equipment alone. This, in fact, is not the case. What is required is that the automatic landing equipment in combination with other aircraft systems, including the crew interface, meet this overall safety criteria.

2. Adequate Demonstration. The reliability was demonstrated by an adequate program of test and analysis.

3. Consideration of Missed Approaches. Our program did consider the issue of missed approaches at or below decision height. In fact, we specifically required Boeing to conduct a missed approach study. Before the B727 was certified for CAT III, Boeing demonstrated safe go-arounds from altitudes at and well below DH, even though as mentioned earlier, all of our aircraft have safe go-around charcteristics from a landing approach to touchdown.

4. Consideration of Aircraft Geometry. The criteria for these systems does consider aircraft geometry. For example, to show the conservatism in the B727 case, even though the CAT IIIa visibility minima and runway width would be the same for the L1011 and B727, the L1011 gear width is almost twice that of the 727, and the L1011 pilot's eye height above the wheels is about 55% greater. Yet the L1011 case is currently accepted by ALPA.

5. Independent Go-Around Guidance. The subject of independent go-around guidance reference is not one which relates to airworthiness certification, but to operations. All U.S. large air carrier turbojet aircraft have redundant attitude gyro information which the crews can use to verify their primary instrument indications, or use in the event of a failure.

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Flight Demonstrations

The only reason there was a flight demonstration at Oklahoma City as mentioned by ALPA was because the Chief, Flight Operations Division, at that time, wanted to experience firsthand the fail-passive features of the B727 automatic landing system. The system was certificated in 1966, and Boeing had to demonstrate to the satisfaction of the FAA engineering personnel that the automatic landing system was indeed fail-passive. There was no requirement for a separate demonstration of the kind made at Oklahoma City. If it had not taken place, the outcome of the certification or criteria would not have been altered. It was not planned to make the approaches in CAT IIIa minima. The occurrence of low visibility was obviously a coincidence since the flight was scheduled considerably in advance. However, the existence of CAT IIIa weather conditions during six of the approaches certainly helped to confirm the conclusion that a B727 with a fail-passive automatic landing system can be safely operated to CAT IIIa weather minima.

As far as testing this, or any other autoland system, in actual bad weather conditions is concerned, no such tests are specifically done as part of the airworthiness approval because an autopilot functions the same regardless of the visibility conditions it is being operated in. In other words, an autopilot's performance is not dependent on the visibility which is reported to the pilot.

NAFEC Tests

The ALPA comments on FAA's NAFEC tests are misleading because they do not consider the purpose for the tests. These tests were not intended specifically to determine the capability of a particular aircraft, such as the B727, but they were intended to see if an autoland equipped aircraft in general could safely land in the event of certain types of ILS anomalies. If another type of aircraft, such as an L1011, was available we could have very well used such an aircraft. In any event, the results of the tests were found to be acceptable, even though repeated landings were made while simulated serious anomalies were introduced in the ILS signals being used by the aircraft's landing system. No beam anomalies were introduced in the glide slope because the course structure of a CAT II and CAT III ILS glide slope is the same; and, as mentioned before, CAT III operations have been approved and conducted for some time now at CAT III facilities.

As in the earlier discussion on ground ILS reliaibility, there is a major inconsistency in the ALPA position. There is no fundamental difference in response of fail-operational autoland systems to ILS anomalies (to which ALPA is objecting). Further, ALPA has concurred with operation of fail-operational systems with no decision height, yet they object to the use of fail-passive systems which, because of the use of the 50-foot DH, makes this operation even more conservative with respect to ILS reliability on these same ILS facilities.

In Conclusion

The FAA believes that the autoland issues raised by ALPA are not based on the facts, that much relevant history is left out of the picture, and that the justifications used to support their conclusions are quite misleading. In any event, the FAA has and will continue to use the best possible and most modern methods, tests, and scientific procedures to fulfill its certification responsibilities to ensure both the airworthiness and operational safety that the public demands.

FAA RESPONSE TO
ALPA'S SUBMISSION ON
ITEM 4; COLLISION AVOIDANCE SYSTEMS

On the subject of Collision Avoidance Systems, the FAA would like to refute Mr. O'Donnell's prime contention that we are committed to a ground based solution and are, in fact, delaying the introduction to airborne solutions. This is not at all true; after much work in this area, the FAA sees no single panacea to the collision avoidance problem and believes a mix of systems, ground and airborne, will be required.

. In the high density, tight control environments, typical of many large terminal areas, high quality collision avoidance systems may require a ground based solution. This is due to the necessity to filter out the false alarms which occur with independent airborne systems, as well as the need to minimize the economic burden on the users.

The ground based system we see accomplishing this is called ATARS--Automatic Traffic Advisory and Resolution Service. This system will be fully automatic and as it name implies, provides both traffic advisories and commands to affected aircraft. This system will reside in computers independent of the ATC computers and its commands will be generated and delivered independent of the controller. ATARS will also require the use of an upgraded beacon transponder system know as DABS--Discrete Address Beacon System--which is now undergoing test and evaluation at the FAA's National Aviation Facilities Experimental Center.

. In addition, for operation outside the high density airspace and until ATARS is available, the FAA is pursuing with equal priority and emphasis the development of two independent airborne Collision Avoidance Systems known as BCAS--Beacon Collision Avoidance System. These two systems differ in their capabilities. The more limited capability active BCAS system will be available earlier, while a more complete full BCAS system will require additional time to perfect.

The FAA believes that the best solution to this problem will require that these two classes of systems be used--the ground based ATARS plus one of the two airborne BCAS systems for complete airspace coverage.

The BCAS approach to collision avoidance has been made feasible through advances in the state-of-the-art in microprocessors. The FAA has built limited experimental models of each of these systems. However, these are by no means complete. Rather, they are partial systems built specifically by the FAA to examine the key technical elements of each approach so that basic feasibility could be established.

Several of the recently cited examples of collision avoidance systems are, in reality, the experimental models built by the FAA in its research

program. We are moving as rapidly as possible toward completing, packaging, and testing these systems so that they can be practically applied to commercial and private aviation.

5. DC-10 Cargo Door.

ALPA issue: " The first hint of trouble came in May, 1970 when a cargo door latch failed and the door opened during a static test at the McDonnell Douglas plant. In November of that year, an engineer for General Dynamics, a main subcontractor for the DC-10 fuselage, wrote an internal memorandum questioning the design of the door latch mechanism and the strength of the cabin floor. Unaware of these reservations, the Federal Aviation Administration certificated the DC-10 in July, 1971."

FAA response: The FAA was aware of the static test failure and the vent door system was incorporated as a result of this failure.

Section 25.365(f) of the Federal Aviation Regulations requires improper closure of the cargo door be taken into consideration in determining the probability of door failure specified in Section 25.365(e). In implementing this regulation, consideration was given to the levels of door closure abuse indicated by past experience and that projected in the future which could be expected in service.

It is still the FAA's opinion that the original DC-10 door design complied with the applicable airworthiness standards. Contentions have been made that the FAA disregarded studies which considered the possibility of complete door failure and the catastrophic results. In reference to these studies, it should be pointed out that they did not envisage or indicate the detailed failure mode of the mechanism which could lead to such complete failure. If FAA were to consider all possible failures in a design during the type certification process without having reasonable substantiating data on the detailed failure mode, it is likely that the FAA would never certificate any transport airplanes.

ALPA issue: "Normally, the FAA would have issued an Airworthiness Directive (AD), a mandatory order with the force of law directing the manufacturer to correct the flaw revealed by the accident. However, the FAA, at the behest of the manufacturer, did not issue an AD. Instead, the manufacturer said it would correct the door latch problem by sending service bulletins to airlines flying the DC-10. These bulletins do not have the impact of ADs, and compliance with them is voluntary."

FAA response: The FAA decision not to issue an AD subsequent to the American Air Lines incident was, as indicated by the Administrator's telegram of June 16, 1972, based on agreement with McDonnell-Douglas and the operators that the modification would be incorporated in production and all delivered airplanes. Within the terms of this agreement, compliance with these service bulletins was not optional. The decision was also based on the fact that there were only a relatively few unmodified airplanes in operation and that the fix would be incorporated in the production line of the DC-10 and should have been incorporated in the Turkish Air Lines DC-10 involved in the accident. As a result of the accident, it was revealed that part of the modification had not been made to the Turkish Airlines DC-10. Further, the French accident report indicates that the lock linkage and the lock tube were not properly adjusted.

6. DC-8 GROUND SPOILERS

ALPA issue: Three serious accidents, caused by accidental deployment of the ground spoilers in the air, killed 170 persons and injured at least 38 others before the Federal Aviation Administration issued a mandatory Airworthiness Directive (AD) to correct the problem.

Ground spoilers are hinged plates on the top of the wing that are designed to pop up and "spoil" the lift of the wing after the aircraft touches the runway. The spoilers help to keep the aircraft on the ground and shorten the stopping distance. When deployed in the air, however, they cause the aircraft to drop rapidly and often strike the ground.

The basic design flaw in the DC-8 ground spoilers was that the control arm was so sensitive that a slight movement in the wrong direction could deploy the spoilers immediately instead of positioning them to deploy automatically as soon as the aircraft landed.

FAA response: When the DC-8 was originally certificated, the ground spoiler system was considered to be adequate. However, the system was subject to misrigging due to service wear and improper maintenance procedures.

In the original design which incorporated nose-wheel strut compression after handing as the logic for autospoiler action, a pull force of nearly 80 pounds was required to manually deploy the spoilers. A late modification incorporating main wheel spinup as auto deploy logic reduced the forces to about 35 pounds.

The design is such that a vertical motion of the handle is required to arm the auto spoilers. Manual deployment requires aft motion of 1-1/4" inches opposed by the aforementioned forces. These forces and motions were believed to be an adequate deterrent to inadvertent deployment.

The service usage and out of rigging conditions resulted in much less force and aft movement being required for manual deployment. In this condition, the FAA agrees, the spoilers are subject to inadvertent deployment. This condition was not discovered until the re-evaluation following the Icelandic accident and resulted in issuance of AD 74-WE-1-AD.

ALPA issue: The first sign of a problem with the spoilers occured in 1968 with a Scandanavian Airlines System DC-8 approaching Bergen, Norway. Although there was no accident, the incident should have served as a warning to the FAA and the industry.

FAA response: We had no information on this incident.

ALPA issue: The second time the problem appeared, it could not be ignored. An Air Canada aircraft crashed while landing at Toronto in July, 1972 after the spoilers deployed prematurely, killing 109 persons. Later that year the FAA, over the objections of McDonnell Douglas, issued an AD advising pilots not to deploy the ground spoilers in flight. A House subcommittee called this AD "almost totally worthless" and said it did little more than tell pilots not to crash their airplanes.

FAA response: At this point, the FAA was satisfied with the design. And, believing this airplane to have been in conformity with the type design, concluded that this accident was caused by the pilots deliberate, though erroneous, action. Hence, the AD warning was issued.

ALPA issue: Another accident occured in November, 1972 when a Japan Air Lines DC-8 crashed after taking off from Moscow. Inadvertent deployment of the ground spoilers was suspected as the cause of that accident, which killed 61 of the 76 persons on board.

FAA response: The Russian accident investigators did not positively conclude that this accident was caused by ground spoiler deployment. It was their best estimate as to the probable cause. This was acknowledged by the Staggers committee, which also found, perhaps correctly, that FAA and McDonnell Douglas should have become more concered.

ALPA issue: The third accident happened just seven months later when an Icelandic Airlines transport was landing at New York. The aircraft was substantially damaged, and 38 of the 128 persons on board were injured.

Not until late in that year and at the request of airlines flying the DC-8 did McDonnell Douglas devise a modification to eliminate the possibility of inadvertent spoiler deployment. The FAA issued an AD in January, 1974 requiring this modification -- almost six years after the first sign of a problem and seven months after the third accident.

FAA response: This accident caused the FAA Western Region to conduct an exhaustive investigation which revealed one mis-rigging condition. This was sufficient justification for the region to issue AD 74-WE-1-AD which called for periodic rigging inspections and reports to the Western Region of conditions found. The AD further required a positive in-flight-lock-out device designed by McDonnell Douglas and furnished at no charge to operators of DC-8 airplanes.

FAA RESPONSE TO
ALPA'S SUBMISSION ON
ITEM 7: GROUND PROXIMITY WARNING SYSTEMS (GPWS)

The ALPA charge on the subject of GPWS, that it took years of industry "pleading--and several fatal crashes" to get FAA to overcome "administrative inaction and delay" is simply not true. During the period before final rulemaking was made in December of 1974, there was a long history of industry controversy on these devices relating to what exactly constituted a ground proximity warning system, how could false alarms be dealt with, and how soon could technical difficulties be resolved permit production and fleet installation. Even among pilot groups there was no clear agreement on the answers to these questions or what should be done. In the end, the FAA published the rule not as a result of congressional or ALPA pressure, but as a result of completion of a thorough FAA study on the matter. The effect of congressional pressure and the tragic TWA accident, if any, was only to expedite the publication of the final rule by several weeks and to advance the compliance date. As it turned out, the compliance date of December 1, 1975, was too optimistic and, due to numerous problems, it had to be extended to September 1, 1976, which was nearly the date that FAA had originally proposed.

The details of the FAA's role in the ground proximity warning system issue has been discussed before in congressional hearings, and the record clearly shows that the ALPA charge that FAA performance is a "sorry example of administrative inaction and delay" cannot be based on the facts of the matter.

FAA RESPONSE TO
ALPA'S SUBMISSION ON
ITEM 8: HEAD-UP DISPLAY (HUD)

The implication of the ALPA submission, that FAA's continuing research on HUD is delaying commercial applications of HUD and that this research is unnecessary because of a decade of military experience, is not correct. In the first place, the FAA has already certified HUD's in the past where specific applications have been made by an operator and were found acceptable (such as the issuance of a supplemental type certificate for a visual approach monitor HUD). At present, a major aircraft manufacturer has recently applied to the FAA for certification of a HUD on an aircraft for delivery to a European airline. The FAA is currently developing criteria for this HUD application, and it is not expected to cause delays in the certification program. The primary reason why more HUD's haven't been certified is that U.S. airlines or manufacturers haven't been active in making such request.

The crux of the ALPA argument for HUD is the implication that use of HUD's should be mandatory. This, however, is a controversial subject because as other industry sources are quick to point out, there is a lack of convincing evidence that a HUD can, in fact, improve approach and landing safety at all or at least as much as equivalent investments in other areas, such as head down displays, landing guidance, or automatic landing systems. Further, if HUD's are ever to be given additional credit for reducing landing minima, such as using a HUD as one part of a fail-operational system, then additional work needs to be done to establish how criteria such as now used for automatic landing systems could be applied to a pilot's use of a HUD.

In this respect, ALPA has greatly overstated the current operational status of the HUD. The military uses HUD primarily for combat and weapons delivery on fighter type aircraft. Military experience with these aircraft in a CAT II or CAT III low visibility landing environment applicable to civil operations is quite limited. Military transports similar to airline aircraft do not have HUD's. In Europe, the French do have operational HUD's in airline service. However:

- These are mainly installed on the Air Inter Mercure fleet. Only 10 Mercures were ever built. It must also be noted that this aircraft is approved by the French for minima the equivalent of about 500 RVR, which is considerably below the minima which were considered for the B727; hence, there is an increased need to consider HUD.

- The Mercure HUD serves primarily as a monitor for the automatic landing system.

- The French have approved takeoff minima considerably lower than our minima of RVR 700. In these instances, the HUD may be applicable to credit for reduced takeoff minima.

- The safety record and nearly all of the CAT III low visibility experience the French airlines have is with the Caravelle which has a fail-passive autoland and no HUD (yet is operated to lower minima than we have approved even for fail-operational systems).

However, it is recognized that a HUD may hold a potential for increasing safety in certain applications. The FAA initiated a program to determine if this was the case in April 1976. Since earlier attempts at such studies had experienced numerous technical problems, the FAA asked NASA for assistance in this HUD study. In March 1977, the Joint FAA/NASA HUD Program began. Preparatory simulator studies have already been initiated and larger simulator studies plus flight tests will be conducted in 1979 to determine what specific contributions HUD's may make to improving safety.

9. DC-9 Stall Warning Horn

ALPA issue: A stall warning horn was built into the DC-9 because the aircraft — unlike most — gives no warning of its own to the pilots tht it is entering a stall. Under certain conditions, an aircraft stops flying when the wings do not generate enough lift to support the weight of the airplane. When that happens, the aircraft is said to "stall." This usually happens at low speeds and with the nose raised — that is, during takeoff or approach when the pilot workload is at its highest.

The problem with the DC-9 stall warning horn is its loudness — slightly greater than tht of the Concorde supersonic transport when it is taking off. The Federal Aviation Administration required the manufacturer to make the warning horn loud enough to be heard by pilots wearing the old earmuff-type earphones (which are rarely worn today) while flying close to thunder. The FAA apparently did not consider the effects on pilots when the stall warning horn sounds accidentally.

FAA response: The ALPA is not correct in referring to a stall warning horn, since the DC-9 incorporates a stick shaker which provides the stall warning. The horn indication is intended as a deterrent to further decrease in speed. The horn, when operating normally, sounds at the stall speed which is 7% lower than the stick shaker stall warning. In addition, the airplane is flight tested at lower speeds than the speed at which the stall deterrent is activitated to account for flight regimes which might be inadverently entered by the pilot.

The loudness of the horn was indeed intended to be audible in the worst case, such as for a pilot wearing muff-type earphones. It is customary for the FAA rules to address the worst case situation, especially for critical flight items assuming safety is not adversely affected. At the time of certification of the DC-9, the stall horn deterrent system was judged to be reliable and not prone to false alarms.

In practice, the operational pilots are trained to prevent a further decrease in speed below the stick shaker, and, thus they never hear the stall deterrent horn except for false warning. However, FAA flight test pilots evaluated the stall deterrent horn and its loudness was considered appropriate to its function and not considered to produce any adverse reaction on an average pilot.

Since the original type certification of the stall deterrent horn, the FAA has approved a system having lesser volume which has been incorporated in all airplanes built since the 705th. This system emits a sound at a noise level of 89 $\pm$ 3 db as compared to the original 109db. Kits are available for purchase by the operators for retrofit on the earlier affected DC-9s having the loud systems.

ALPA issue: The Air Line Pilots Association reported in early 1970 that DC-9 pilots werecomplaining about the loudness of the stall warning. In August, 1971, the warning horn on a Southern Airways DC-9 accidently sounded. After the incident, the captain reported, "The noise was so distracting that normal thought processes and trouble-shooting were hampered. I can imagine what the potential could be if this system activated on some dark night on approach. It would be impossible to communicate to the tower or even initiate a go-around, as commands to the first officer to raise the gear and flaps would not be heard."

Two months later, a North Central Airlines DC-9 captain told an FAA inspector the stall warning horn "was so loud it caused virtually a partial incapacitation of the thought processes of both my first officer and myself."

FAA response: The FAA continues to believe the original sound level to be acceptable, as described above to perform its intended function to deter deep stall. The new sound level may be considered as a design improvement for normal operation and as such, was not deemed to be required equipment. The FAA recognizes the problems described by ALPA as being associated with unwanted, false warnings. As such, an AD was prepared and signed on June 2, 1978, and is being considered for adoption as a rule shortly, which requires modification to the system to alleviate the false warning problem. The noise level will remain optional with the operator at 109db or 89db.

10. Designated Engineering Representatives (DER's) and Designated Manufacturing Inspection Representatives (DMIR's)

ALPA issues: One of the basic deficiencies in the present system is the use of Designated Engineering Representatives (DER's) by FAA. The basic problem with this system is that they are employees of the manufacturer. They are paid by the company that employs them, not the government agency that is charged with carrying out the public trust. It is easy to see where the employee's loyalty will lie when push comes to shove.

To show the magnitude of this practice, take the case of the McDonnell Douglas DC-10. Of the 42,950 inspections required during the certification process, DER's reportedly performed 31,895 of them or nearly 75 percent. The reason for this practice is that the amount of technical data involved -- drawings, analysis, reports and computer programs -- is far beyond the resources of the FAA to check. Considerable latitude is given each DER in reaching decisions concerning the acceptability of detailed design features.

The pressure on the DER's to approve each item needing approval is apparent. The manufacturer's production schedule is paramount. The high costs of schedule slippage, delivery delays, or redesign to accommodate an FAA position can create an urgency to approve a step or a design feature that might otherwise be seriously questioned.

FAA response: The ALPA issues are concerned with DMIR's as well as DER's. The Federal Aviation Administration (FAA) has delegated certain of its functions to private persons and corporations to act as Representatives of the Administrator to assist in the type certification process. There are a number of different forms of delegations (designees) used by the FAA in both aircraft and airman certification. Two types of designees used in the type certification process are Designated Engineering Representatives (DER's) and Designated Manufacturing Inspection Representatives (DMIR's). The authority to delegate functions of the Administrator derive from Title III Section 314 of the Federal Aviation Act of 1958.

The extent of delegation is individually selective, depending on the person's knowledge of the regulations, and his education and past experience. Designees are considered to be highly qualified experts in their specialized field and are responsible persons of high integrity and high ethical standards. Designees are subject to training and supervision by the Regional Engineering and Manufacturing branches.

DER's are limited to conducting or witnessing tests and preparing, reviewing, and approving data only as needed by the FAA. DER's are not delegated functions in certain critical areas such as determination of compliance with basic loads and flight characteristics testing which are carried out by FAA personnel. DER's are not allowed to issue type certificates for aircraft, aircraft engines, or propellers. Final approval authority of these products under the DER System rests with the FAA.

In the type certification process, DMIR's are limited to witnessing tests and conducting conformity inspections. Generally, in the type certification process of transport category airplanes the DMIR is under direct supervision of the Principal FAA Inspector assigned to the manufacturer. In this case, the DMIR conducting the inspection for the FAA is usually not the same person conducting the inspection for the manufacturer.

Currently, there are approximately 800 DER's, approximately 650 of these are employed by manufacturers, and more than 500 DMIR's all of which are employed by manufacturers. This compares with a total of approximately 450 technical personnel directly employed by FAA who are currently engaged in the type certification process.

If the FAA were to discontinue the use of designees in the type certification process, it is obvious from the above that the FAA would have to increase its technical personnel significantly at considerable expenditure to the government and public. The use of designees in the type certification process is estimated to save the public 30 to 40 million dollars a year.

The designee system was first instituted in 1940, and the performance of the designee over these many years has been excellent with no developing trend or history of compromise of safety in favor of pecuniary corporate interests. We believe that the designee system is and has been very advantageous to the government, the public, and the industry. The designee system has reduced the cost of government to the general public. It has enhanced the manufacturer's ability to meet its certification and delivery schedules. These benefits have accrued without derogation of safety and reliability of our transportation system. The safety record of our certificated air carriers speaks for itself.

Appendix 4.—Additional Requested AIA Responses on the Fail-Passive Autoland System

Responses to questions on autoland system asked during the Burton Hearings

#1 Ref. page 217 of transcript - with regard to the number of flight tests performed by Boeing.

Answer: Boeing has performed approximately 350 automatic landing approaches in 727's in which performance has been recorded by on-board instrumentation. These tests include the period of original certification in 1968 to the present.

#2 Ref. page 226 of transcript - with regard to why a 700 ft. RVR supports the pilot task.

Answer: At the decision height, at least three sets of runway lights or "bars" are visible. These lights amply support a judgment as to alignment with the runway.

Additional Information on 727 Autoland for the Burton Subcommittee Hearings Held September 1978

The question of visibility for Category IIIa landings came up during the hearings. Mr. Butterworth has recently asked Jean Lawrence if any additional data exists. In reviewing his question and in reviewing the testimony given at the hearings, it appears that an oversight was made. Although a copy of a writeup describing the 727 autoland was furnished to Mr. Butterworth before the hearings, we may not have made it clear that we wished the writeup to be a part of our testimony. A copy of this writeup is attached for inclusion in the testimony. The attachment describes the operational experience (75,000 landings) in the last ten years on the system approved for CAT II approaches. FAA Advisory Circular 20-57A dated 12 January 1971 pointed out, as a purpose, to accumulate data "for systems which may be approved for Category IIIa in the future".

The issuance of Advisory Circular 120-28B, dated December 1, 1977 is a follow-up after the accumulation of sufficient experience to warrant lower minima.

As answered in the questioning during the hearings on page 218, the plan is to certify operations at an intermediate RVR (1,000 feet), as shown in the Advisory Circular, before proceeding to the 700 RVR minima. The experience gained would be useful in determining the value.

Furthermore, it was suggested that Mr. Butterworth ask the FAA because they are the agency that set the limit.

If we can be of further assistance, let us know.

R. W. Taylor

Attachment

36-953 O - 79 - 41

727-AUTOLAND

The Boeing Company has, for some years, installed automatic landing systems in all our jet transports except the 737. The design of such a system for the 737 is currently under way. Similarly, most other jet transport manufacturers offer autoland options in their aircraft. Therefore while the body of my remarks will be directed to the 727 autoland system, the matter of automatic landing universally applies to nearly all jet transport models.

In order to put this matter in perspective it is appropriate to consider that the 727 "fail-passive" autoland system is a logical extension of the "ILS approach" system which is standard equipment in nearly every jet transport operating today. These aircraft and their systems are designed to operate under Category II weather conditions of 1200 feet RVR (Runway Visual Range)* --- meaning visibility

*An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end; it is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR is used in lieu of RVV and/or prevailing visibility in determining minimums for a particular runway.

a. Touchdown RVR - The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

b. MID RVR - The RVR readout values obtained from RVR equipment located midfield of the runway.

c. Rollout RVR - The RVR readout values obtained from RVR equipment located nearest the rollout end of the runway.

ICAO - Runway Visual Range - The maximum distance in the direction of takeoff or landing at which the runway or the specified lights or markers delineating it can be seen from a position above a specified point on its centerline at a height corresponding to the average eye-level of pilots at touchdown.

of one-quarter mile. A Decision Height/DH** of 100 feet is the minimum value employed. Decision Height means the altitude by which, and below which, sufficient visibility must continually exist to support a manually controlled landing, in the pilot's conservative judgment, or else a go-around, must be made and thus the landing aborted. These same concepts of minimum visibility values and Decision Height are retained for the new Category IIIA, 50-foot Decision Height certification.

The perfect safety record, over the years, with Category II operations is one essential ingredient confidence in the safety of the extension of that type operation to further reduced weather minimums. Another ingredient, and the substance of my remarks today, is the design characteristic of the 727 "fail passive" autoland system. Category II operations are routinely conducted with single and dual autopilots or flight directors which have no built-in capability to detect faults. The 727 has a very secure capability to detect faults and limit their effects to small values.

The Boeing design approach inherently provides a high level of safety for autoland operation and to meet the FAA regulations performance and safety criteria. An extensive set of data which confirms achievement of the design goals and the FAA requirement has been furnished to the FAA over the period of the last ten years. The data was developed

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**With respect to the operation of aircraft means, the height at which a decision must be made during an ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.

ICAO-Decision Height - A specified height at which a missed approach must be initiated if the required visual reference to continue the approach to land has not been established.

through computer simulations, reliability and safety studies and through actual flight tests on carefully instrumented 727 test aircraft. As may be imagined, many man-years of engineering effort have been expended in gathering, analyzing and preparing that data.

The accompanying illustrations portray the inherent safety by showing the consequence of operational variables.

All of the first four figures include a simplified illustration of the pilot's Attitude Director Indicator (ADI) in the upper right hand corner. One of these instruments is located directly in front of each pilot displaying much of the information required for "instrument condition" approaches. The Instrument Landing System (ILS) radio beam deviations are shown on the left and bottom sides of the instrument. All landing approaches under instrument conditions to low altitudes, fundamentally depend on the guidance information furnished by these ILS beams. This dependency applies to all approaches whether made by the pilot manually, or through a single channel autopilot in coupled approaches, or by fail-passive autoland systems (as the 727 or 747) or by fail-operational autoland systems as on some 747's or 1011's. These beams are installed on the ground and oriented such that, if followed, the aircraft will cross over the approach end of the runway approximately fifty feet above the runway and on centerline. Also shown on each of the four figures are a side view and a top view scene of an aircraft in the final phase of the landing approach. Only a portion of the runway is depicted.

(FIGURE 1)

The nominal performance for the 727 autoland system is illustrated in Figure 1. As the aircraft descends on a stable flight path through 100 ft. altitude above the runway (as is noted by reference to the radar altimeter instrument) the ILS beam deviations are zero. The autopilot continues to operate the pitch and roll controls to bring the aircraft to a touchdown, on centerline, approximately 1400 feet down runway. The pilot disconnects the autopilot, through a conveniently located button on the control wheel, shortly after touchdown. He performs the steering and braking of the airplane on the remaining runway.

(FIGURE 2)

A variation in system performance results largely by the influence of atmospheric winds and turbulence. The system has been certified for operation in winds of up to 25 knots headwind, 10 knots tailwind and 15 knots crosswind. The winds and other influences result in the touchdown point variation illustrated in Figure 2. If the ILS beam deviations, as the aircraft descends through 100 feet altitude, are less than or equal to the values shown in Figure 2; then the aircraft will touchdown within the hatched area shown. All things considered, this performance can be expected better than 95 percent of the time. Should the deviations at 100 feet be in excess of the "gate" values shown the pilot may elect to go-around or land manually. A manual landing would be accomplished only, if in his judgment, sufficient visibility and alignment exist. It should be noted that very extensive and bright runway lighting is installed at all 35 or so Category II runways at which the operations are performed to provide alignment and landing cues.

The serious concern with safety in these operations is the effect of component failures. This is the reason for providing redundant sets of sensors (radio receivers, etc.) and autopilot computations. Fail-passive systems employ two complete sets of equipment that operate simultaneously. By design the effect of a fault is confined to a small departure from the normal flight path. Highly reliable automatic monitors continuously cross-check the two systems for any disagreement between them: If the disagreement exceeds a preset threshold, then both systems are automatically disengaged. When this happens, the pilot is alerted through flashing lights and a warning horn, and he takes over control of the trimmed aircraft.

(FIGURE 3)

The key to the design of a fail-passive system is to ensure that no fault or even improbable combination of faults, can cause a hazardous departure from the intended path, especially at low altitude. The consequence of a worst case faulted condition is illustrated in Figure 3. For any fault occurring below 150 feet or so, and assuming the aircraft lined up at 100 feet altitude, the aircraft will touchdown within the cross-hatch region shown in Figure 3. It is important to note that this cross-hatched region represents the "worst case" fault situation. That is, a case where the magnitude of the fault and its initiation point is such that fault detection does not occur until just as the aircraft touches down. All faults of lesser magnitude or later initiation result in touchdown well within the cross-hatched zone. All faults of larger magnitude or earlier initiation result in automatic disconnect before the aircraft flight path reaches the extremity

of the lines, in side and top view scenes, leading to and encompassing the cross-hatched zone. Again, it should be stressed that the cross-hatched zone is the "worst case" faults. These, of course, are highly improbable, but nevertheless they are the basis for assuring inherent safety through design.

(FIGURE 4)

In Figure 4, the normal performance variations of Figure 2 are combined with the "worst case" fault effects of Figure 3 to give the net resulting aircraft touchdown for highly improbable faults under conditions of wind and turbulence. In summary, if the aircraft has been tracking the ILS beams and passes through the "gate" at 100 feet with ILS deviations less than or equal to the values indicated on the Attitude Director Indicator, then complete assurance exists that the airplane will either touchdown within the confines of the runway, or the autopilot will automatically disengage before these confines are exceeded.

(FIGURE 5)

The 727 go-around performance is illustrated in Figure 5. An altitude loss of 15 to 25 feet, depending on pilot technique, will be experienced between the time go-around is initiated and the moment the aircraft is at minimum altitude. Thus, for go-arounds initiated at the 50 foot decision height, touchdown will not occur. For go-arounds initiated well below the 50-foot decision height, either because visibility deteriorates or automatic disengagement occurs, momentary touchdown may take place. However, recalling that the aircraft in all cases is flying within the confines of the runway, there is no hazard. For

all go-arounds in low visibility, the pilot reverts back to the use, principally, of information on the Attitude Director Indicator (ADI). A command bar, driven by the flight director system which is entirely independent of the autopilot, provides pitch and roll reference information to be used in the go-around.

This concludes my remarks on the design approach for the 727 fail-passive autoland system.

(FIGURE 6)

A few words on the operational experience that exists with the 727 system are in order. The 727 system, certified for Category II operations with a 100-foot decision height, has been in service for ten years. Approximately seventy-five thousand landings had been made with the system before any reduction in decision height or visibility were made potentially possible by the recent FAA regulation pertaining to the 50-foot decision height. As stated earlier, virtually all jet transports are certified to operate to 100-foot decision height with only single channel autopilots which rely entirely upon the pilot to detect faults and to perform the landing touchdown. The 727 autoland system which has been extensively tested, in service, represents a significant step forward in providing additional safety for operations in low visibility conditions.

In conclusion, for all the above reasons, The Boeing Company unreservedly endorses the FAA's new Category IIIa certification category for fail-passive systems on aircraft as the 727. Thank you for the opportunity to speak to you on this matter.

727 AUTOLAND SYSTEM NOMINAL PERFORMANCE

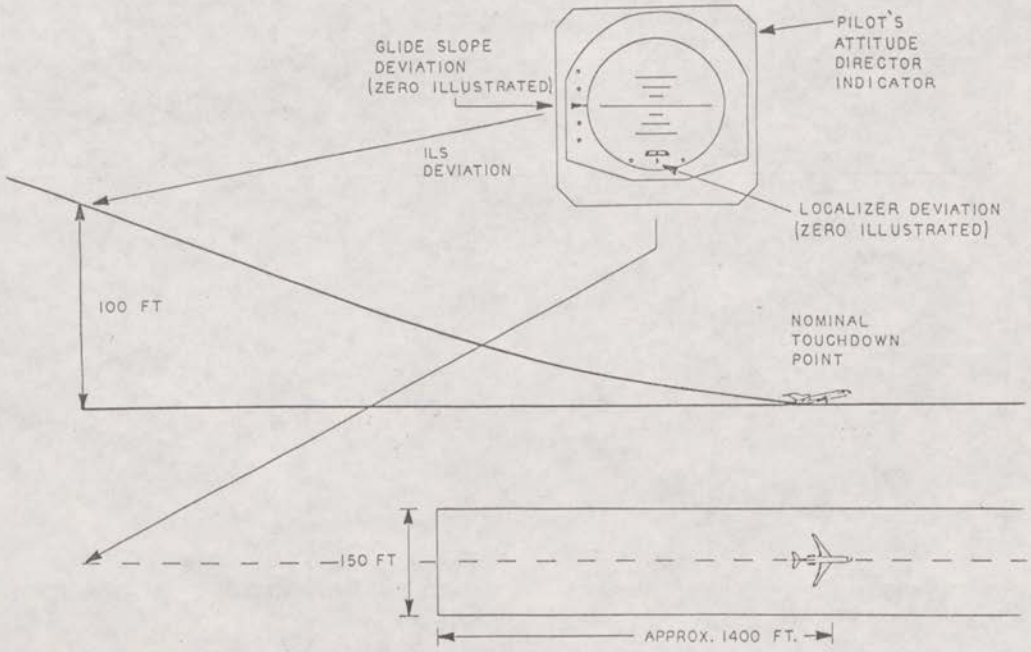

FIGURE 1

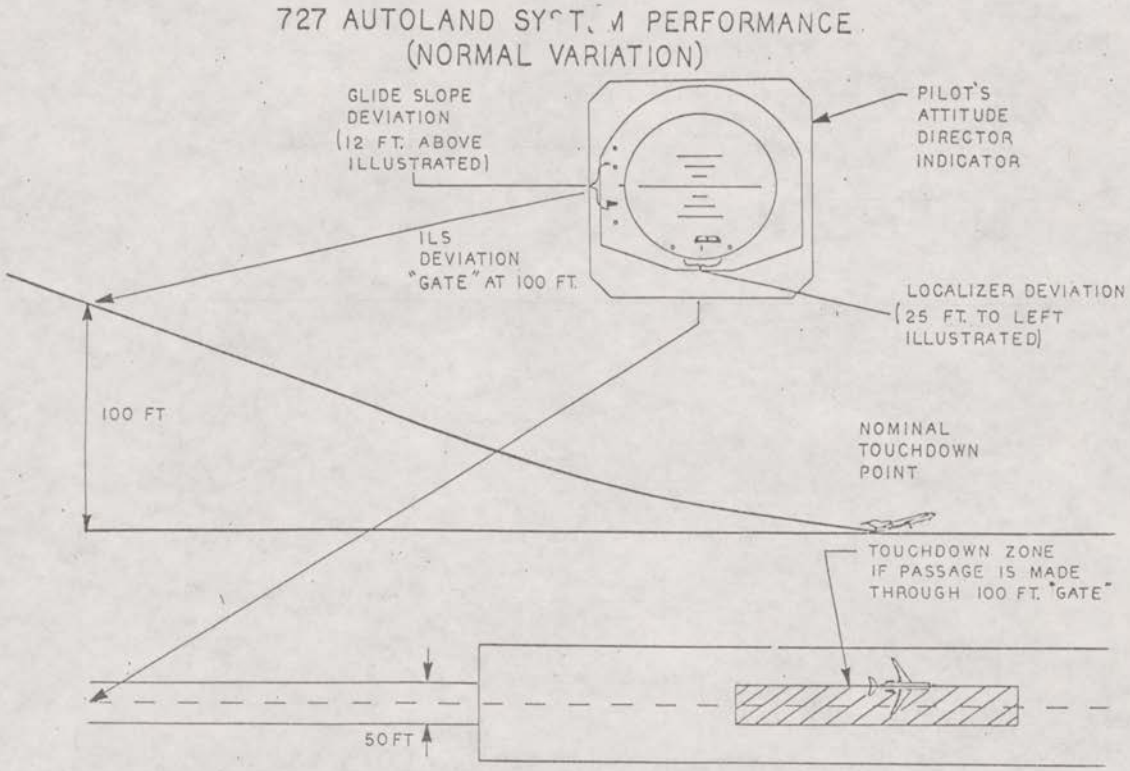
727 AUTOLAND SYSTEM PERFORMANCE
(NORMAL VARIATION)
GLIDE SLOPE DEVIATION (12 FT. ABOVE ILLUSTRATED)
PILOT'S ATTITUDE DIRECTOR INDICATOR
ILS DEVIATION "GATE" AT 100 FT.
LOCALIZER DEVIATION (25 FT. TO LEFT ILLUSTRATED)
100 FT
NOMINAL TOUCHDOWN POINT
TOUCHDOWN ZONE IF PASSAGE IS MADE THROUGH 100 FT. "GATE"
50 FT

FIGURE 2

727 AUTOLAND SYSTEM PERFORMANCE (WORST CASE FAULTED CONDITION)

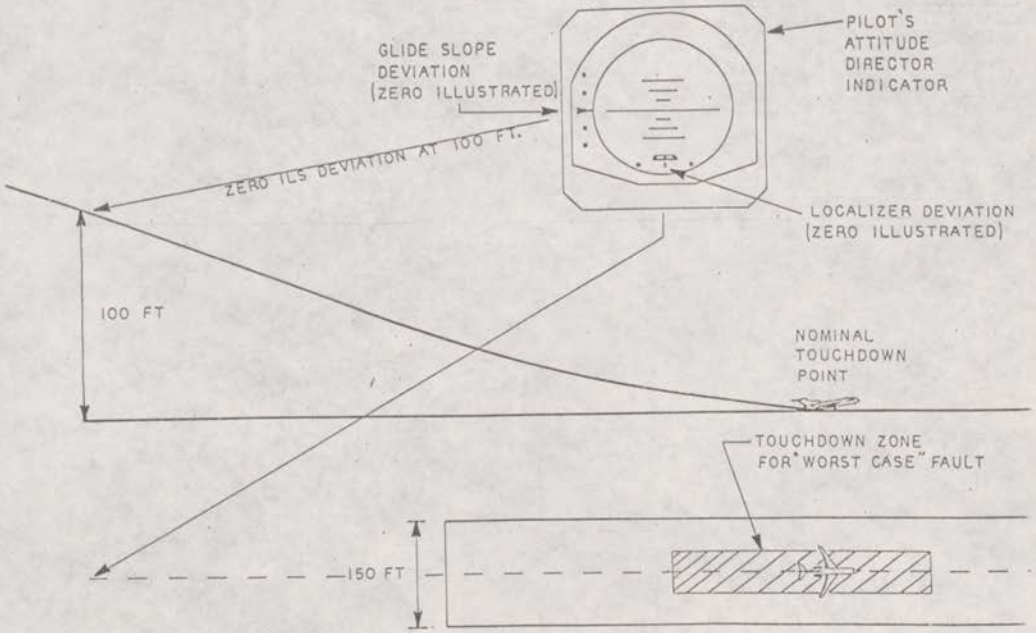

FIGURE 3

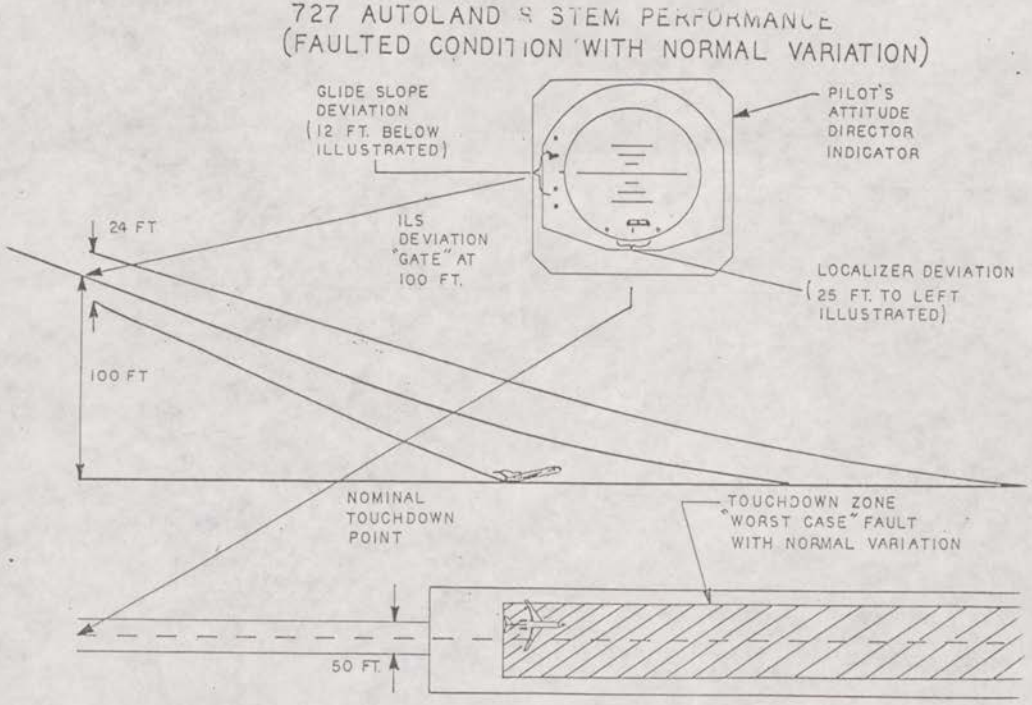
727 AUTOLAND SYSTEM PERFORMANCE
(FAULTED CONDITION WITH NORMAL VARIATION)
GLIDE SLOPE DEVIATION (12 FT. BELOW ILLUSTRATED)
PILOT'S ATTITUDE DIRECTOR INDICATOR
24 FT
ILS DEVIATION "GATE" AT 100 FT.
LOCALIZER DEVIATION (25 FT. TO LEFT ILLUSTRATED)
100 FT
NOMINAL TOUCHDOWN POINT
TOUCHDOWN ZONE "WORST CASE" FAULT WITH NORMAL VARIATION
50 FT.

FIGURE 4

727 GO-AROUND PERFOR..ANCE

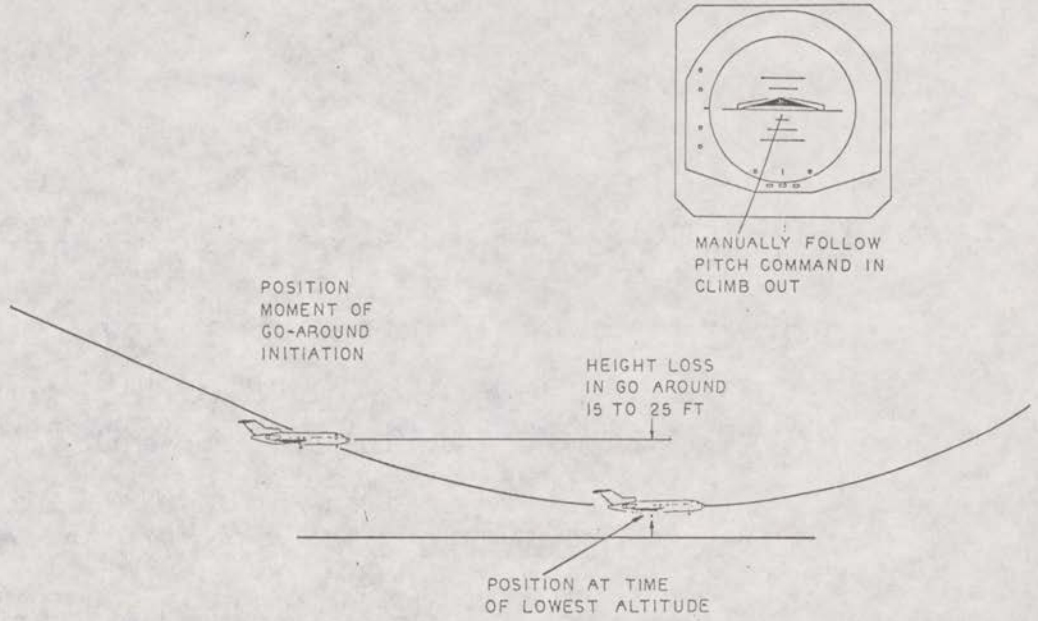

FIGURE 5

727 AUTOLAND EXPERIENCE

- CERTIFICATED TO CAT II IN 1968 (100 FT. DECISION HEIGHT)
- OVER 100 SYSTEMS DELIVERED BETWEEN 1968 AND PRESENT
- APPROXIMATELY 75,000 AUTOLANDS PERFORMED IN USA BY AIRLINES TO DATE
- NO HAZARD OR ACCIDENT HAS BEEN KNOWN TO ARISE IN SERVICE
- CERTIFICATED TO 50 FT. DECISION HEIGHT IN 1976

FIGURE 6