Senate Hearing

Before the Committee on Appropriations

F–18 Navy Air Combat Fighter

Fiscal Year 1976

94*th* CONGRESS, FIRST SESSION

H.R. 9861

SPECIAL HEARING

F-18 NAVY AIR COMBAT FIGHTER

HEARING

BEFORE A

SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
UNITED STATES SENATE

NINETY-FOURTH CONGRESS

FIRST SESSION

ON

H.R. 9861

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE FOR THE FISCAL YEAR ENDING JUNE 30, 1976, AND THE PERIOD BEGINNING JULY 1, 1976, AND ENDING SEPTEMBER 30, 1976, AND FOR OTHER PURPOSES

Printed for the use of the Committee on Appropriations

SPECIAL HEARING

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TUESDAY, OCTOBER 21, 1975

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m. in room 1223, Everett McKinley Dirksen Office Building, Hon. John L. McClellan (chairman) presiding.

Present: Senators McClellan, Pastore, Inouye, Young, Hruska, Stevens, and Symington.

Also present: Senators Chiles and Goldwater.

F-18 NAVY AIR COMBAT FIGHTER

OPENING REMARKS BY CHAIRMAN

Chairman MCCLELLAN. The subcommittee will come to order.

The Chair will make a brief statement. On May 5, 1975, this subcommittee held a hearing on the lightweight fighter aircraft program, including the F-16 and F-18. These are expensive programs and they have generated considerable interest and some controversy.

This hearing today has been called to further insure that the committee members have the opportunity to hear all of the pertinent facts and get full and detailed information relating to the lightweight fighter program.

Subsequent to our hearing on May 5, the subcommittee heard Department of Defense witnesses concerning the GAO investigation of the memorandum of understanding for the F-16 sale to Europe. We hope these hearings today will complete our inquiry into the F-16 program, including the GAO decision on the protest of the LTV aerospace contract award for the F-18.

SUMMARY ON GAO DECISION AND MEMORANDUM

At this point I will insert in the record a summary of the GAO decision on the LTV protest and a copy of a memorandum which I sent to each member of this Defense Subcommittee regarding this meeting today. The full GAO decision will be retained in the committee files.

[The summary and memorandum follow:]

DECISION OF THE COMPTROLLER GENERAL OF THE UNITED STATES

B-183851 OCTOBER 1, 1975.
Re LTV Aerospace Corp.

1. Protest raising issues concerning interpretation of appropriation act and "congressional intent" as public policy will be considered in this case involving selection of a Navy Air Combat Fighter (NACF), whether or not timely filed, since protest raises significant issues concerning relationship of Congress and Executive on procurement matters. Issues regarding evaluation and competition will also be considered since they are substantially intertwined with first issue and since GAO has continuing audit interest in NACF program.

2. Navy is not required as matter of law to expend funds provided in lump-sum appropriation act for a specific purpose when statute does not so require, notwithstanding language contained in Conference Report. Absence of statutory restriction raises clear inference that the Report language paralleled and complemented, but remained distinct from, actual appropriation made. Therefore, Navy selection of particular aircraft design for its Air Combat Fighter and resultant award of sustaining engineering contracts cannot be regarded as contrary to law.

3. While protester argues contract award by Navy should be regarded as void since it is not in accordance with public policy as expressed in congressional Conference Report, award is not contrary to statute, contract does not require any actions contrary to law, and does not represent a violation of moral or ethical standards. Therefore no basis exists to conclude that award is contrary to public policy.

4. Although protester argues that Navy did not comply with DOD reprogramming directives, those directives are based on nonstatutory agreements and do not provide a proper basis for determining the legality of expenditures.

5. Provision in appropriation act which prohibits use of funds for presenting certain reprogramming requests cannot operate to invalidate contract awards even if awards resulted from reprogramming action since a violation of such provision cannot serve to invalidate an otherwise legal contract award.

6. Protester's assertion that Navy properly could select only derivative of model selected by the Air Force is incorrect, since reasonable interpretation of RFQ, read in context of applicable documents, indicates that Navy sought aircraft with optimum performance (within cost parameters) and with due consideration of design commonality with prior Air Force prototype program and with selected Air Force fighter.

7. Protester's claim that Navy did not treat offerors on equal basis is not supported by record, which indicates that overall evaluation was conducted in accordance with established criteria and that both offerors were treated fairly.

8. Assertion that engine selected by Navy was not authorized for use with lightweight fighter is without merit, since record indicates selected engine is modified version of baseline engine listed in solicitation. Also, record indicates Navy did not improperly estimate offerors' engine modification costs.

9. Navy's cost evaluation of competing proposals was conducted in accordance with proper procedures and established criteria since the Navy's development of its own estimates in determining cost credibility was consistent with sound procurement practices and award of contract to higher priced offeror was not improper.

10. Restriction of competition in Navy procurement for Air Combat Fighter (ACF) to offerors furnishing designs derived from Air Force ACF program was proper even though Navy selected derivative of design different from that chosen by Air Force, since solicitation was intended to maximize commonality of both technology and hardware between Air Force and Navy designs and Navy selection was in accordance with solicitation criteria regarding commonality.

CONCLUSION

For the various reasons discussed above, we have concluded that the Navy's actions were not illegal or improper and that therefore the protest must be denied.

As indicated in the Introduction section, the Congress has manifested significant interest in DOD's LWF/ACF programs and has closely monitored the Navy's attempt to develop a lightweight, low cost fighter that could operate effectively from aircraft carriers. The statement in the Conference Report on the 1975 DOD Appropriation Act that "future funding is to be contingent upon

the capability of the Navy to produce a derivative of the selected Air Force Air Combat Fighter design" suggest that the Congress will be closely scrutinizing the Navy's choice before full-scale development funds will be provided. Thus, the ultimate determination regarding further F–18 development has yet to be made.

ELMER B. STAATS,
Comptroller General of the United States.

U.S. SENATE,
COMMITTEE ON APPROPRIATIONS,
Washington, D.C., October 10, 1975.

Memorandum to: Members, Defense Appropriations Subcommittee.
From: John L. McClellan, Chairman.
Subject: Hearing on F–18 Navy Air Combat Fighter.

The Committee will hear Department of the Navy witnesses regarding the Navy Air Combat Fighter on Tuesday, October 21, at 10:00 AM.

Several members have requested that the hearing be held to inquire into the controversy surrounding the GAO report on the Ling-Temco-Vought appeal to the selection of the F–18. Other areas of inquiry will be the cost estimate, the lack of commonality with the Air Force F–16, and the alleged inferior capability of the F–18 vis-a-vis the F–14.

I hope you will be able to attend the hearing.

STATEMENT OF HON. DANIEL K. INOUYE, U.S. SENATOR FROM HAWAII

INTRODUCTION OF WITNESSES

Chairman MCCLELLAN. We have a number of witnesses to be heard today. Among them are Senator Daniel Inouye, Senator Barry Goldwater, Senator Lawton Chiles, Senator John Tower, Hon. Paul Dembling, General Counsel of the General Accounting Office, Hon. George A. Spangenberg, former Director of the Evaluation Division of the Naval Air Systems Command, and also Hon. William P. Clements, Jr., Deputy Secretary of Defense.

Senator Young, is there any statement before we proceed?

Senator YOUNG. I have no statement.

Chairman MCCLELLAN. Senator Inouye, we will hear these witnesses in order, unless there is an objection. You are recognized.

STATEMENT OF SENATOR INOUYE

Senator INOUYE. I have a statement which I wish to include in the record as though read in person, sir.

Chairman MCCLELLAN. Very well, the statement of Senator Inouye will be printed in the record at this point.

Senator INOUYE. There are several issues related to the development of the lightweight fighter program—or the Navy air combat fighter program, as it was designated by Congress—which are deserving of further exploration.

PROGRAM CONTROVERSY

First of all, everyone here is well aware of the controversy surrounding the selection of the F–18. The Navy decided that they could not use any derivative of the YF–16 because they could not be made carrier suitable. In fact, the Navy decided to select the loser of the Air Force prototype fly-off competition.

Moreover, although the Congress directed the Navy to take advantage of the Air Force lightweight fighter program and technology generated by an ongoing program, the Navy did not really comply with the intent of Congress. Congress canceled the VFAX program, renaming it the Navy air combat fighter program (NACF), but it is curious that the Navy has ended up with what it wanted, which is essentially a VFAX aircraft.

As my colleague the Honorable Mr. Chiles is well aware from the hearings which his committee held, the commonality which Congress directed that the Navy and the Air Force obtain in a lightweight fighter in a conference report accepted by both Houses of Congress was never obtained and all prospect of interservice commonality was quickly lost.

"FLY BEFORE BUY" PRINCIPLE

The second point that I would like to touch on is the concept of flying before buying. No one can dispute the fact that the F–18, although it is a derivative of the YF–17, has never been tested, because one could hardly fly a plane that has not yet been built.

There can be no questioning of the fact that the selection of the F–18 violates the principle of fly before buy, which calls into question the performance of the F–18 and its capability to execute its assigned mission within the Navy.

The Navy ostensibly wants the F–18 to complement the F–14. I am advised that the F–18 is indeed a more capable aircraft in the area of close-in combat or dogfighting for it is a lighter and more maneuverable plane.

But perhaps we should question the need for a dogfighter at the present time. We might then ask just how the F–18 would be used by the Navy and which jobs it can do that the F–14 cannot perform with greater capability. What we might also want to ask is how the F–18 fits in with the future plans of the Navy.

The idea of incorporating a V/STOL, a vertical, short-takeoff and landing fighter-attack aircraft into the Navy's inventory sometime in the future is not a remote possibility. I question the advisability of the Navy's decision to lock into a program through the turn of the century.

At the very least, the Department of Defense and the Navy should provide Congress and this committee with a clear picture through justification of each aircraft as it would fit into the present and any future configuration of aircraft carriers in the Navy and the Marine Corps.

COST OF F–18 PROGRAM

More to the point, however, is the cost of the F–18 program. The Department of Defense in 1974 and on May 6, 1975, claimed the lightweight fighter would be less capable but about half the cost of the F–14 and F–15. Yet Navy testimony has shown that the cost of acquiring the F–18 or the cost of that program through 1985 will cost $700 million more.

Also, Navy data which was made available to Congress shows that the 400 additional fighters they need will cost, in 1975 dollars, $5.36 billion, as opposed to $4.6 billion for additional F–14's. The second 400 F–18 aircraft to replace A–7 aircraft acquisition will cost $2.4 billion, as opposed to $1.66 billion for the A–7.

Hence, the alternative of buying more F–14's and A–7's would cost $6.26 billion and would, therefore, be less expensive than buying 800 F–18's at a cost of approximately $7.77 billion. The difference is approximately $1.51 billion. This is, of course, the cost of acquiring more F–14's and A–7's versus buying F–18's and does not include the operations and maintenance costs for either aircraft. Nor does it include or in any way take into account the future replacement of A–7's in the Navy's force.

But in all the figures that have been thrown around comparing these Navy aircraft, no cost growth has ever been allowed on the F–18. Yet the Department of Defense testified that the average cost growth of the last 10 major programs was approximately 13.2 percent.

There has been so much confusion over the cost of the F–18 program and the performance of the F–18 itself that I see a great deal of danger in moving ahead with this program. Perhaps the F–18 program should be canceled. Perhaps many of my colleagues think that the Navy's F–18 program is worthy of support. But if the Navy truly has what it needs to meet the threat of the future, then it has a responsibility to provide this committee with adequate information about the Navy's future plans in order that we can make a well-informed and carefully considered decision to continue the F–18 program, to delay that program awaiting proof of its worth or to cancel that program on just grounds.

That is my statement, sir.

Chairman McCLELLAN. If you have nothing further to add to your statement, we will proceed with our next witness.

STATEMENT OF HON. BARRY GOLDWATER, U.S. SENATOR FROM ARIZONA

OPPOSITION TO METHOD OF OBTAINING AIRCRAFT

Chairman McCLELLAN. Senator Goldwater, as a distinguished member of the Armed Services Committee, as well as a pilot in your own right, you have possibly more knowledge about airplanes than any other man in the Senate. We certainly welcome your counsel on the problem confronting Congress respecting this lightweight fighter plane. You may proceed.

Senator GOLDWATER. At the outset I want to tell you that this is one of the most unpleasant moments that I will go through because I don't believe, in my years in the Congress, I have ever opposed a weapons system. I want to make it clear that I don't oppose the F–18 weapons system. I oppose the way that they have gone about obtaining it.

I appreciate the opportunity to make a statement to this subcommittee on the F–18 aircraft program. I have concluded, after much review, that the program should not proceed as now planned and I will have some recommendations for you later on in my statement.

I would like to stress that the conclusions I have come to about this program are not the result of any particular political interest. Certainly I am fully aware of the heavy pressures being exerted, but I have no special ax to grind in that regard.

Therefore, as best I can, I will give you my objective opinion of the lightweight fighter program with particular reference to the F–18.

After my many years in the Congress, I like to think we have the collective wisdom to make the correct judgments necessary to keep America No. 1 in national defense. However, I do not think we have done very well in that regard with this program. In fact, the lightweight fighter program as it has developed is a mess, and we are no closer to commonality between the Navy and Air Force than when we started.

COST SAVINGS AS A RESULT OF COMMONALITY

Not only that, but each service will be adding another, but different, aircraft to its own tactical air force. These are tactical air forces that I feel are, in essence, structured to do about the same thing, at least to the point where there could be more commonality and subsequent cost

savings than we will reportedly get from this and the Air Force program.

I might interject, Mr. Chairman—because you and I have discussed this—it is easy to talk about commonality in Air Force and Navy fighters, but you can't buy an aircraft for one and then make it common to both. If you are going to make the aircraft common, it has to start in the core design because an airplane adaptable for carrier landings will require approximately a 10-percent increase in weight and this increase in weight requires also different engines to achieve the same type of performance from Navy operations as the Air Force gets from land operations.

So if we are going to talk about commonality it has to start right at the design table and not go from, let us say, the F–16 to take that now and try to make a Navy fighter out of it.

Chairman McClellan. Will the Senator yield at that point? In order to have a common plane, does it not require a compromise of the Air Force plane in order to accommodate the Navy plane, the extra weight and strength?

Senator Goldwater. Yes, but it is rather difficult—in fact, I would say it is almost impossible—to take an existing Air Force fighter and make it into a Navy fighter.

Now, we can go the other way. We took the F–4, the Navy developed and designed a fighter and adapted it to Air Force. In fact, it probably turned out to be a better maneuvering aircraft because less weight is required.

If we are going to talk about commonality, we shouldn't talk about it after one airplane has been accepted, particularly a land-based aircraft. So when I talk about commonality I want to make it clear that we are talking about starting from scratch and, as I develop my arguments, I think you will see that one of my objections to the F–18 program as we are talking about it today stems from the fact that this really has not been done.

Mr. Chairman, I would like to develop some of my arguments here and you can pursue it by questioning.

ORIGINAL REQUIREMENTS FOR F–16/F–18

It is my opinion that the Air Force with the F–16 and the Navy with the F–18 find themselves today in the position of developing aircraft for which neither had an original requirement. This doesn't mean each service cannot use these aircraft in their respective force structures for meaningful missions.

Fortunately the services have great flexibility which enables them to survive our collective, but sometimes not too wise, political wisdom. To illustrate, we have already heard the services support these airplanes during testimony this year.

But as a matter of interest, Air Force still has the F–16 or the air combat fighter Required Operational Capability (ROC) document under preparation. It is this document that sets forth the requirement for a new aircraft and it is normally completed prior to a development program.

Of course, there are other ways to generate a requirement for a new aircraft but usually the requirement is generated by the major

command having need of the system. For example, requirement documents have been prepared for the F–15, A–10, B–1, AWACS and the Advanced Airborne Command Post because there was an Air Force generated requirement for these systems. About the only value the F–16 ROC will have at this late date is for historical purposes.

NAVY'S FIGHTER PROGRAM PLAN

The Navy story is not too different. The Navy's fighter program was on track until 1971, when the existing plan to buy an all-F–14 force was changed by then Deputy Secretary of Defense Packard. He limited the approved buy to 313 F–14A's, which was the number then in the 5-year defense plan. However, he did not foreclose future procurement.

Then later, financial difficulties resulted in limiting the procurement rate to 50 F–14's per year whereas a rate of up to 96 per year had been planned. This further raised the unit cost.

In 1973, because the F–14 program costs were high and because of the previously cited financial difficulties, Deputy Secretary Clements proposed a prototype fly-off program between a lower cost version of the F–14 and a naval version of the F–15. However, Congress rejected that as too expensive.

In April 1974 Navy, still trying to plan its fighter force, recommended an improved F–14 without the Phoenix system, although it could be installed later. This was rejected by the Secretary of Defense but Navy's proposal to study VFAX, a multimission fighter and attack aircraft to replace F–4's and eventually A–7's, was approved.

In June 1974 Navy issued the presolicitation notice for VFAX but in August the House Appropriations Committee deleted the VFAX funds, indicating development and procurement of aircraft by Navy and Air Force that are as identical as possible would result in substantial savings.

At about the same time, the Senate Appropriations Committee cut the VFAX fund request from $34 million to $20 million and directed the Secretary of Defense to provide a report justifying the need for duplicative development of a lo-mix fighter aircraft by both Air Force and Navy.

Next came the appropriations bill conference report in September 1974 which canceled VFAX and directed that the $20 million be placed in a new program element titled "Navy Air Combat Fighter." It also stated that future funding for the NACF was to be contingent upon the capability of the Navy to produce a derivative of the selected Air Force air combat fighter design.

NAVY'S CHOICE FOR FIGHTER FORCE

From this review it is apparent to me that Navy's choice for its fighter force, in order of priority was:

1. All F–14's—requested by Navy but disapproved by OSD.
2. Improved F–14 but without Phoenix—requested by Navy but rejected by OSD.
3. VFAX—requested by Navy but rejected by Congress.

4. Navy air combat fighter, F–18—not requested by Navy but directed by Congress, but not as now contemplated.

Mr. Chairman, on the one hand Air Force has the F–16 because of OSD direction and on the other hand Navy has the F–18 because of indirect congressional direction. It gives me cause for concern when I see the services having to accept systems when they did not generate the specific requirement.

Nevertheless, I recognize that Air Force and Navy have testified in support of these programs as meeting their requirements. In fact, Navy has testified that if the VFAX was completed today, the end result would probably not be that much different from the F–18.

Personally, I question how that could be because during our 1973 Tactical Airpower Subcommittee hearings, Navy witnesses indicated that derivatives of either the YF–16 or YF–17 appeared to have insufficient capability to be useful in Navy missions. Yet a little more than 2 years later we appear to be headed toward a multibillion dollar program with a derivative of the YF–17.

As I said before, I think this is a case of Navy making the best of a situation it did not want.

Mr. Chairman, we got into this situation because the F–14 and F–15 programs seemed to be getting too expensive. The idea of a lightweight fighter, especially one that was common to both Navy and Air Force, was appealing because "lightweight" was synonymous with "cheap" or at least "less expensive." It appeared we could make up any lack of quality with increased quantity.

F–16/F–18: LACK OF COMMONALITY

However, the way the program is now structured, we have missed on the common airplane objectives. We missed because we went about it the wrong way. I think the only way that we could get Navy and Air Force to agree on a common fighter aircraft is to, figuratively speaking, lock Navy and Air Force designers in the same room until they could agree on a common core aircraft.

Since carrier suitability is the most difficult requirement, Navy would have to have priority. The Air Force aircraft, in a sense, would be a derivative of the Navy design rather than the other way around as was done with the F–18.

So, Mr. Chairman, the objective of commonality that Congress wanted between Navy and Air Force aircraft is not going to be achieved. Air Force and Navy are headed toward separate lightweight fighter programs which we hope will provide us with the force effectiveness required and for a lesser cost. However, I am not convinced this is the case with the F–18.

We must continue to remember that Navy is now proceeding with the F–18 because of congressional guidance, not because of a stated Navy requirement. We must ask ourselves: Is this really the program Congress wants and, more importantly, is it the aircraft that Navy needs? Are there other alternatives Navy could take that will give it an effective fighter and attack force within reasonable dollar limits?

I think these questions must be answered before we proceed any further with the F–18 program.

PROGRAM COSTS

In a chart submitted for the record to the Senate Subcommittee on Federal Spending Practices, Efficiency, and Open Government on Air Combat Fighter Programs, there was a comparison of costs, in constant fiscal year 1975 dollars in thousands, for 400 F–14 or 400 F–18 aircraft, supplementary to the 390 F–14 program. The cost to procure an additional 400 F–14's is $5.252 billion for a unit price of $13.1 million. The cost to procure 400 F–18's is $5.431 billion for a unit price of $13.6 million.

I should point out that the additional F–14's are A models and Navy has testified that beyond the 390 it would require the F–14B, so totals would have to be adjusted.

For the F–18 the $1.4 billion development costs are included. However, what interested me about the chart was that the F–18 does not become a less expensive system until operating costs are included. I believe Navy testified that the crossover point came at about the seventh to ninth year of operation.

What I find wrong with these comparisons is that they are on a 1-for-1 basis. That is, it is assumed that one F–14 equals one F–18 and vice versa. During our tactical airpower hearings on the F–18 I asked Navy to provide the total cost in 1975 dollars to procure additional F–14 aircraft equivalent in effectiveness to 400 F–18's. When we have this data at hand, maybe we will find the F–18 is not the way to go.

We also need to examine procurement and life cycle costs of the improved F–14 without the Phoenix capability. Remember that Navy requested this version but was turned down by OSD. These costs need to be compared to the F–18 and an equivalent effective force ratio between these two aircraft should be determined.

ATTACK VERSION OF F–18

There is another point that needs to be made relative to the costs of the F–18 program. Most of the program costs are pegged against 800 aircraft, a portion of which are planned to be the attack version, or the A–18. If that costing is accepted, it means the decision is being made today on the aircraft that will replace the A–7E force between 1985 and 1990. Assuming a 15-to-20-year aircraft life, the A–18 will be around until 2005 or 2010. Can we make that kind of decision today on what we know about this aircraft?

For example, do we know for sure that the A–18 has the growth potential to be able to survive through that time period? You will recall that the Source Selection Evaluation Board report questioned the density loading of the aircraft and indicated it would be desirable for a new aircraft to begin with 15 percent less density.

The question arises as to how well both the F–18 and the A–18 can be grown or modified through the years to meet the changing threat. We should be sure that potential is there. It may be that only the specialized aircraft will be able to survive and successfully accomplish its mission during that time.

On the other hand, if it is argued the decision on the attack version of the F–18 can be made much later or is really not being made today, then any costs, in my opinion, must be pegged against the fighter version only.

UNRELIABILITY OF COST ESTIMATES

At best, the estimated costs for this program are questionable. If past and present programs are any measure, the F–18 program will not make its estimates. If our concern here is cost—and I believe it is—we must get these F–18 costs nailed down. Otherwise we will find ourselves in the position of buying for the same or more money a system less capable than the F–14 it is to complement.

For example, during our Tactical Airpower Subcommittee hearings, I asked, for the record, what allowance has been made for cost growth in the F–18 program cost estimate and was the allowance in keeping with current program experience. Navy replied that provisions for change orders are inherent in the data base used in estimating and were included in computing the F–18 costs.

I am not sure I understand that but I am concerned that Navy was unable to provide a dollar figure since that amount must have been computed in order to arrive at total estimated program costs. Certainly we should know what management reserves have been included in Navy's estimates. Are we willing to proceed with the program on this basis?

At best, Mr. Chairman, the cost estimates for this program have to be considered pretty soft.

ENGINE DEVELOPMENT

As you know, the F–18 is totally dependent on the successful development of the F–404 engine, which is a fan version and a derivative of the YJ–101. During our tactical airpower hearings on October 8, I asked, for the record: "What arbitrary increase in performance was assigned to the F–18 as the result of using predicted F–404 engine performance?" The purpose of the equipment was to determine how much better the F–18 would perform with the F–404 over the YJ–101.

Admiral Houser replied, in part:

> There was no arbitrary performance increase assigned. Engine performance data were derived from the YJ–101 flight test data base developed during the USAF lightweight fighter competition. These data were analyzed by technical experts forming the base line for evaluating the improvements to the engine design and determining performance estimates.

It may be a matter of semantics but I think the estimated increase in performance of the F–404 over the YJ–101 at this time has to be somewhat arbitrary. For example, Air Force General Alton Slay, commenting on the YJ–101 engine in his statement to the Subcommittee on Federal Spending Practices, Efficiency, and Open Government, on May 20, 1975, stated:

> . . . the thrust of the YF–101 engines in the YF–17 was some 6-7 percent less than forecast for the production J–101s after a full scale development program.

Dr. Malcolm Currie, Director, D.D.R. & E, when testifying to this committee during your lightweight fighter hearings on May 6, 1975, in response to a question by you, Mr. Chairman, about the percentage difference in the J–101 and the F–404, stated:

> That is the change I am talking about, about 6 percent in complexity, 8 percent in cost, and for that you get the increased thrust that Admiral Lee mentioned, about a 17 percent increase in thrust and much better fuel consumption characteristics . . .

Mr. Chairman, the F–18 is totally dependent upon the successful development of the F–404 engine. Including the cost of development engines, the estimated cost for the F–404 is about $300 million and will take well over 4 years, maybe even 5.

It seems to me that there is enough risk, enough cost, and enough concurrency in the engine program alone to warrant your serious thought as to whether to proceed with the F–18 program, at least as it is now structured. A schedule slip in the engine development would be costly but could probably be accommodated. However, failure to achieve the required engine performance could not be accommodated.

You will recall General Slay indicated there was a 6 to 7 percent shortfall in thrust of the YJ–101 engine. Also, recall that Dr. Currie indicated a 17-percent increase in thrust over the production version of the J–101 was required.

I may be making an apples and oranges comparison but it looks to me like an increase in thrust of over 20 percent is required from the YJ–101 to the F–404. It may be that the F–18 was not assigned an arbitrary increase in performance using predicted F–404 engine performance, but if that thrust is not achieved the F–18 will be looking for space in a museum.

Are we willing to take that kind of risk?

OTHER CONSIDERATIONS

Mr. Chairman, again during our F–18 hearings I asked, for the record, What air wing combination of F–14 and F–18 squadrons does Navy consider to be the most cost effective force for the fleet air defense mission and strike missions.

The answer for the fleet air defense mission was two F–14 and two F/A–18 squadrons. For the strike mission there was no definitive answer as to what the mix should be. Further, when I asked if OSD accepted this air wing combination analysis, the answer was that OSD had not reviewed the Navy's studies on air wing combinations.

Mr. Chairman, it seems strange that the Department of Defense should be embarking on an 800-aircraft program without OSD having made an analysis of how these aircraft will be used in the Navy force structure. On what basis, then, was the program approved?

RECOMMENDATIONS

Mr. Chairman, I recommend the F–18 program not be approved because other alternatives appear to offer the Navy a more effective fighter and attack force. I have stressed my concerns over F–18 program costs but it is not the estimated total amount that bothers me as much as what we will get for that amount. I think, for the time being, we will be better sticking with a proven system like the F–14, whose capability and cost, although high, is known and in hand, rather than proceeding with an unknown.

Navy has stressed that, with the F–18/A–18 in the force, it will have only two fighter/attack aircraft in its inventory—namely, the F–14 and the F–18/A–18. Of course, the same would be true with all F–14's and A–7's even when an aircraft specialized for the attack mission replaces the A–7. Therefore, the F–18 program offers no advantage in that regard.

I recommend continuing with the F–404 engine development program. I do not believe we should develop new engines only when they can be matched against a particular aircraft. The development of the F–401 engine should also be continued.

I recommend a further analysis of the costs of continuing with F–14's be made. The Grumman cost data provided during our Tactical Airpower Subcommittee hearing was considerably different from cost data provided by Navy.

As an aside, Mr. Chairman, we should not allow unit costs and program costs to be the only measure of whether we approve or disapprove a program. Our first consideration must be: Can and how well will the aircraft do the mission? Cost effectiveness is one measure but it should not be allowed to override mission effectiveness. There is no point in losing a battle with a cost-effective but mission-ineffective system.

I recommend Navy again examine the improved F–14 with provision to add the Phoenix system. This option needs to be compared to the F–18, especially as to growth potential over its operational lifetime.

Finally, Mr. Chairman, I recommend Navy be directed to provide cost comparisons of continuing to replace the A–7 force with improved A–7's as required versus procuring 400 A–18's. This course of action presumes eventual replacement of the improved A–7 by an aircraft specialized for the attack mission.

CHILES' PROPOSAL

Senator Chiles was not able to testify before I did, but I know approximately his position and I want to make these few points about it:

The Chiles' proposition will propose a land version of the F–18 and carrier version of the F–16. This would delay production of the F–16 and services could eventually select one or the other. I think this plan is unwise and it is opposed, of course, by the Air Force.

Now, as I said before, for common-core airplane—and I say "core"; that is the guts of the airplane—we have to get the Air Force and the Navy designers together before construction and not after. Then that design should be completed industrywide.

What happened here was, in my opinion: The Navy did not follow exactly the instructions of the Appropriations Committees of both Houses. Frankly, to do so, as I have said previously, would have been almost impossible. What they have done is to take a few little chunks from the F–17 and taken the ball of wax over to another aircraft manufacturer not engaged in the original competition and substitute an engine that has not been completed. It is, in effect, a paper engine. I have no doubt that the engine can be developed and will be developed, but, it is not ready now.

Chairman McClellan. McDonnell Douglas was not in the original competition?

Senator Goldwater. Not in the orginal competition, it wasn't. We had the F–16 with General Dynamics; and the F–17, which was Northrop. Then in the Navy competition, LTV in combination with GD proposed the F–16 derivative; and McDonnell Douglas with Northrop proposed the F–17 derivative.

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NEED FOR COMPETITION

Let me say here, in defense of the Navy's position, any aircraft manufacturer in this country can make a highly acceptable, high-performance interceptor aircraft. But in keeping with the spirit that we have always operated under, I think it should be achieved by competition.

In other words, if the Navy found no way of accepting a derivative of either the F–16 or the F–17, then I think Navy should have come to the Congress and made that report. Then the Congress, in its wisdom, if we have any, could have said: "All right, let us start from scratch and design by competition a Navy fighter."

Now, they could take the best of the 16 and the best of the 17 and take the best of the Navy background and Marine background and Air Force background and come up with requisites on which the companies could compete, and then the Navy could select.

Now, Mr. Chairman, I think you will hear testimony from expert witnesses later who will say that the F–14 is the best fighter plane that we have, and personally I think in a competition against the F–16, the Air Force fighter, if the F–14 competed, with its maneuverable wing operation, I think it could outfight the F–15. However, I question whether it could do it with the wings in a fixed position.

I think the F–14 is the best fighter aircraft we have in the inventory, so why not continue to buy this airplane. The Navy has testified time and again that they could even use it for their interdiction or close air support if they had to. I somewhat question that, but that is their business, and they know more about it than I do.

F–18 LIFE CYCLE COSTS

A 400 F–18 program, life cyclewise, is going to cost about $7 billion without any plans in that figure for inflation. A 400 F–14 program, on the same basis, is going to cost about $8 billion. I think when we get all through with it, the F–18 will cost about as much per unit as the F–14; so we haven't, in effect, developed a lightweight fighter at a lesser cost. That was really one of the concepts of a lightweight fighter—to build a bigger fighter force at less money.

Navy has stressed that, with the F–18/A–18—and this is something that may come as a surprise to the Appropriations Committee; we are talking about an F–18 and the Navy is also talking about an A–18, which is a second aircraft, which would be an attack version of the F–18. This is, of course, something we didn't contemplate at all in the lightweight fighter program.

I think, therefore, that the F–14 plus the A–7, until a lightweight Navy attack aircraft can be developed, should be the Navy force.

I would contemplate that this combination would extend at least through the 1980's. But the F–14 certainly will be as good an interceptor aircraft as we can build, long-range interceptor aircraft and even a short dogfight-type of aircraft if we have to modify it a bit, until the 1990's.

Mr. Chairman, that completes my formal statement and off-the-cuff remarks. If you have any questions, I would be happy to try to answer them.

RECOMMENDATION ON F–16 PROGRAM

Chairman McClellan. What about the F–16 program? Are you satisfied that we should proceed with it?

Senator Goldwater. Oh, yes; I think on the F–16 I am a little disappointed in the cost it has reached; I would have been much happier had it remained down near the $5 million mark that we were talking about. There is no question about its performance. It probably has the highest rate of climb of any aircraft in the world. The Air Force is very pleased with it. I think it is probably the best small airplane we have ever built.

Chairman McClellan. You spoke of the engine in the F–18 as being a paper engine—one that has not yet been tested. Is that a Pratt & Whitney engine?

Senator Goldwater. No; it is General Electric.

PRATT & WHITNEY LETTER

Chairman McClellan. I received a letter yesterday from Pratt & Whitney regarding the engine in the F–16. I don't know that it is necessary, but I will insert their letter in the record here, unless there is any objection.

I did not know that it had been questioned.

Senator Goldwater. Well, it has been.

[The letter follows:]

Pratt & Whitney Aircraft Division,
United Technologies Corp.,
October 20, 1975.

Hon. John McClellan,
Chairman, Committee on Appropriations,
U.S. Senate
Dirksen Senate Office Building,
Washington, D.C.

Dear Mr. Chairman: Senator Lawton Chiles' letter to you stating his views on the F–16 and F–18 Air Combat Fighters presents a very interesting proposal. The desire to structure a weapon system program with controls to protect against cost overruns and failure to meet mission requirements is certainly understandable and laudable. We believe, however, that the two competitions leading to the selection of the F–16, first by the USAF, and subsequently by the NATO Consortium countries, have already provided such controls. Furthermore, the proposal recommended in the Senator's letter, if adopted, might easily be viewed by the NATO Consortium countries as a breach of our agreements. Defense preparedness and aerospace industry employment were the major factors in the NATO choice of the F–16 over the French Mirage F–1E and the Swedish 37E.

The Consortium countries need to begin the process of replacing their aging F–104 fighters now. With serious recession factors at hand, their national aerospace industries' employment levels have to be maintained. Therefore, any evidence of delay or lack of U.S. Government support of the F–16 program, in our opinion, would reopen the European competition for the Air Combat Fighter. It would also have a disastrous effect on the relationships developed through many months of delicate negotiations with each of the four Consortium countries. I believe the implementation of Senator Chiles' plan would be regarded by the NATO countries as nullifying our agreements with them. Their logical response would be the choice of the "Mirage" aircraft because of attractive immediate economic and political advantages to which the French government committed during the competition.

The impact of this action on the United States would be the loss of $15 to $20 billion in foreign export sales, over 65,000 jobs, and the opportunity to strengthen NATO.

Control desired by Senator Chiles to ensure meeting the aircraft cost and performance requirements is, in our opinion, already a part of the F–16 program as currently planned by the USAF. The Air Force chose the F–16 in a fly-off against the YF–17 on the basis of clearly superior performance and lower cost.

The open competion in Europe with the Mirage F–1E and SAAB 37E airplanes resulted in an intense analysis of all the program areas by a select evaluation team on which all four NATO countries were represented. The result was the independent selection of the F–16 by each of the four Consortium countries. In large part, this was based on the airplane and engine combination having convincingly demonstrated its capability in the prototype flight test program. As for our F100 engine in particular, it is not a "paper engine". It began flying in the F–15 in July 1972 and has been in operational service for nearly a year in the F–15s flown by the USAF Tactical Air Command. There are now over 17,000 flight hours on production engines; therefore, the performance of the F100 engine is known. Production of the engine for the F–15 aircraft during the past year has verified the costs as consistent with our fixed-price contract (negotiated *during the competition* against the YF–17) for engine deliveries through 1981. Engine performance and maturity are being demonstrated daily in the F–15 airplane. It is expected to have over 800,000 flight hours of experience by the time the first production F–16s are delivered.

In summary, we believe that the controls Senator Chiles is recommending for the F–16 program have already been provided and that any delay in proceeding with the planned development of the aircraft could easily destroy the NATO Consortium part of the program.

In view of all these facts, I strongly urge that you continue to support the F–16 program as the Air Combat Fighter for the U.S. and for the NATO Air Forces.

Very truly yours,

E. V. MARSHALL,
Vice President and General Manager,
Florida Research and Development Center.

ENGINE RESEARCH AND DEVELOPMENT

Senator GOLDWATER. I think the country makes a mistake and the Congress makes a mistake in not emphasizing more continuing R. & D. in engines. We are always a little bit behind in engines. If we do get the idea that we can have a common-core aircraft between Air Force and Navy, we know that the Navy has to have an engine of higher thrust because the aircraft is going to weigh more, and when it weighs more, the existing engine will not give the performance that it needs.

But we wait sometimes years for the aircraft companies to improve the engines because we have never emphasized, in my opinion, the need for continuing research and development in the aircraft engines.

Chairman MCCLELLAN. Senator, is the F–18 designed to fill that gap in air support?

Senator GOLDWATER. The F–18 is supposed to be a carry-on—I won't put it that way—it is supposed to be an interceptor fighter for close-in interceptor work, air superiority maintenance by the Navy to protect the fleet. Now, in my opinion, the F–14 can do that, particularly if the Navy is allowed at this time to go ahead with the VFAX program. The Congress hasn't allowed the Navy to do it. I am looking now at the time frames, the 1980's——

Senator SYMINGTON. The Congress hasn't allowed the Navy to do what?

Senator GOLDWATER. To proceed with the VFAX. It was prohibited by the appropriations conference report last year.

I am looking forward to the 1980's, which is the F–18 time frame, and all I am saying is: If we are going to have an F–18, let us have an

F–18 that has been developed by competition between the companies who want to get into the competition.

REOPENING OF COMPETITION

Chairman McCLELLAN. Would you favor opening up the competition to all aviation manufacturers, or limiting it to the two original competitors, Northrop and McDonnell Douglas?

Senator GOLDWATER. I would open it up to any manufacturer who wants to get in the act or any combination of companies. It may be that Lockheed and McDonnell Douglas might want to go together.

Chairman McCLELLAN. McDonnell Douglas is a part of the F–18 now.

Senator GOLDWATER. Yes; but the point I tried to make is that any aircraft company alone—the Navy or the Air Force or the Marines could go to any aircraft company in this country and tell them what they wanted and that company could build it. But that is without competition. I think we should just announce that the Navy has plans and let the Navy define those plans carefully and submit them for competition between the companies and the engine companies.

Chairman McCLELLAN. That would mean building a new engine?

Senator GOLDWATER. Not necessarily; they might wind up with the same engine we are talking about, but we would be further down the road, and the engine would be ready when the airframe would be ready.

Chairman McCLELLAN. It has been suggested by some that we just reopen competition between the original bidders.

Senator GOLDWATER. I would throw it open, and I think you would wind up essentially with the original people, that is right.

NAVY INSISTENCE ON TWO-ENGINE PLANES

Chairman McCLELLAN. The plane the Navy rejected—the F–16—was a one-engine plane, was it not?

Senator GOLDWATER. That is right.

Chairman McCLELLAN. And the Navy insists, I believe, that their planes have two engines.

Senator GOLDWATER. Well, any pilot can understand that.

Chairman McCLELLAN. I think so.

Senator GOLDWATER. The two engines for Navy use is highly desirable, although the accident rate, as I recall it, between single-engine compared to two-engine is not as great a difference as you would think. I could understand the Navy's desire for two engines and I certainly wouldn't argue that. One engine can get them back to the ship.

Chairman McCLELLAN. If we reopened the competition on the F–18, would you limit it to twin-engine designs, or would you also leave that open?

Senator GOLDWATER. No; I think the Navy—we are getting now into competition for one service and not multiservice.

Chairman McCLELLAN. That is right; we have already reached that point.

Senator GOLDWATER. The Navy sits down with their experts and comes up with an idea of an airplane that they would like. Obviously the F–18 would probably be substantially what they would ask for, a twin-engine airplane, but let them be satisfied completely with what

they are going to ask for, and then turn that type of aircraft over to competition between the companies.

I don't think the delay would in any way affect the Navy's capability. They could still get their aircraft in the 1980 time frame, which is what they were talking about with the F–18.

Mind you, now, they also want to make whatever the aircraft is into an attack version, and we didn't talk about that when we were talking about the F–16 and F–17 competition. In my opinion, the A–7 will carry the Navy along through the 1980's in good fashion and, if we care to make an attack model out of whatever "F" aircraft they come up with, that would be up to us.

F–14 MODIFICATIONS

Chairman McCLELLAN. You spoke earlier of an F–14 modification. Do you think that would be practicable and should be considered if the competition is reopened?

Senator GOLDWATER. No; I don't think so. I think the F–14 as it is will serve the Navy well, right up into the 1990 period. It was originally designed as a long-range interceptor with the Phoenix system, and it is very, very successful.

The modifications that we talked about and the Navy wanted to investigate would have made more of a close-in support fighter or air superiority fighter than it is now configured in the 14–A. There are some people who say taking the Phoenix system out would not enhance its dogfight capability but I would have to see that proven before I would buy it. In the meantime they have an airplane that can be used until they get the airplane that they say that they need.

My argument is: They should get the airplane they say they need through the competitive process and not going to one manufacturer with little bits and pieces to come up with an airplane.

Chairman McCLELLAN. I understand, then, you would favor providing them with the plane.

Senator GOLDWATER. Eventually, yes. They have to have carrier aircraft.

Chairman McCLELLAN. The only issue in your opinion then, is whether we should take the F–18 as it is or reopen it to competition. You favor reopening it to competition.

ADVANCED AIRFRAME

Senator GOLDWATER. Yes; I think we come up with a better aircraft.

Senator YOUNG. There has been one alternative suggested, Senator, and that is this airframe is further advanced than the engine. You would hold up the question of the airframe and go ahead with the engine?

Senator GOLDWATER. Probably the F–18, because it is not even in the construction stages yet and, by the time it was ready to fly, the engine might be ready for it. But we don't know now for certain whether the engine will produce the thrust that they say it will. I would much rather see engines waiting out there for us to hook airframes onto.

Senator YOUNG. What is the time frame of the prototype?

Senator GOLDWATER. It would be in the 1980's. The Navy can testify more accurately. I would say 1980 at the earliest.

Senator YOUNG. That is all I have.

Chairman MCCLELLAN. Senator Stevens, do you have any questions?

Senator STEVENS. No, Mr. Chairman, I don't think so.

F–18 AS A VFAX

Senator INOUYE. Senator Goldwater, in your statement you indicated that Congress rejected the Navy VFAX proposal. But isn't it true that the F–18 is a VFAX?

Senator GOLDWATER. No; not as I see it.

Senator INOUYE. So your recommendation is that we stop the F–18 program as presently conceived?

Senator GOLDWATER. That is right.

Senator INOUYE. And in the meantime continue in the purchase of F–14's?

Senator GOLDWATER. That is right.

Senator INOUYE. And reopen the program?

Senator GOLDWATER. That is exactly my position. And if the Navy needs close air support aircraft, interdiction-type aircraft, the A–7, in my opinion, modified as necessary, will perform wonderfully into the 1980's, when they will have an attack aircraft that will probably be capable of more speed and maybe pass Mach 1, although I wouldn't say that is too highly desirable; but if we want it we can get it that way. We can get an aircraft by then that will carry possibly more load, but that in itself isn't too much needed in my opinion.

Senator INOUYE. So, as presently conceived, you do not believe that the Nation will be getting its money's worth out of the F–18 as compared to the F–14?

PRICE INCREASES IN F–18 PROGRAM

Senator GOLDWATER. I don't because of the flight characteristics I have referred to and the price. Mind you, when we talk about a lightweight fighter, we started out talking about $3 million. We are now talking—this F–18—the program costs will be about close to what the F–14 will be. We are talking about a $13 million fighter unless they are bought in extremely large amounts.

But we are not developing in the F–18 what I consider to be one of the main advantages—an ability to buy a large number instead of a limited number because of costs.

Senator INOUYE. Thank you very much.

Senator CHILES. I don't have any questions, Mr. Chairman.

Senator SYMINGTON. Thank you, Mr. Chairman. I have a letter I would like to read from Sanford McDonnell. It is short, a page and a half, and it refers to many of the matters that have been referred to, which Senator Goldwater brought up, and it also is an answer to some of the points that Senator Chiles has made.

I have heard only verbally from Senator Goldwater that he opposed the F–18 but I received a letter that Senator Chiles sent you and he asked for comments to the letter. I have also talked to various people in the Navy and in the Department of Defense about it.

But the letter is what I think would be interesting because I think I have had a little of experience in the aviation field myself and I don't want to take issue with the Defense Department, the Secretaries and the service itself, unless I am sure of my facts.

SENATOR CHILES' LETTER ON F–18

Chairman McClellan. Before you read the response to Senator Chiles' letter, I think it only proper that we insert a copy of the original correspondence.

U.S. Senate,
Committee on Government Operations,
Washington, D.C., October 7, 1975.

Hon. John L. McClellan,
Chairman, Committee on Appropriations,
Washington, D.C.

Dear Mr. Chairman: As you may recall, when I testified before the Defense Subcommittee last May you and I went off the record to discuss one issue that was particularly troubling to both of us: the Air Combat Fighters, the F–16 and F–18.

Since that time, I have had the chance to review the record of testimony taken by the Appropriations Committee and my subcommittee on Federal Spending Practices has held extensive hearings. I am writing to thank you for the assistance of the Committee and to let you know how I have come to view the situation.

It is my conclusion that we must reintroduce direct competition to the F–16 and the F–18 programs and hold open the possibility for commonality if we are to have any hope of meeting the program estimates for cost and performance. Specifically, I intend to propose that the Appropriations Committee adopt report language to:

Earmark $15 million dollars in the F–16 appropriation to conduct the first year's work leading to the prototype demonstration of a carrier-based version; and conversely,

Earmark $15 million in the F–18 appropriation to conduct the first year's work leading to the prototype demonstration of a land-based version.

This language would set these programs into an acquisition pattern recommended by the 2½ year study of the congressional Commission on Government Procurement. It would reopen a competitive threat to keep the cost and performance of *both* aircraft in line; commit us to only a step-by-step approach to keep open our options until we have more than paper promises, and hold open the option for cost savings resulting from common aircraft for Navy and Air Force.

Unless such a middle ground step can be taken, I believe we should then reconsider a moye to delete all funds for the F–18 and to restructure the F–16 program to more clearly reserve major productional commitments.

Overall, I have become convinced that the opportunity for commonality is real but has been artificially foreclosed with pre-emptive decisions and loose arguments. Further, both these programs, if *not* opened up to more hardware development, will inevitably lead to the same force structure disruptions we have seen in past programs similarly based on paper competition. The F–18 and the F–16 programs are being conducted so as to guarantee, I believe, cost overruns and performance shortfalls.

Let me review some of the specific reasons I have reached this conclusion.

In the first place, there never was a consistent, well thought-through decision on the military need for these two new programs. The Air Force prototypes began as—and were never understood to be anything more than—"technology demonstrators", completely off-line from any force structure plans. The Navy was proceeding slowly with its VFAX studies and its own "technology demonstrator prototype", the XFV–12A.

The General Accounting Office verified that:

"the Air Combat Fighter's performance requirements were not derived from the threat. We could not find, even in the Air Force as late as February 1975, a direct relationship between the required capability of the Air Combat Fighter with the threat aircraft that was expected. Similarly, with respect to the Navy,

the program was not well-defined with regard to program cost estimates, performance requirements and schedule milestones".

Never were the mission needs analyzed to see whether or not they were sufficiently similar so as to justify a new program—started from scratch—to give us savings through commonality.

Instead, the Air Force Lightweight Fighter prototype "demonstration" was compressed into a full-blown program competition. The aircraft flown at Edwards AFB were only engine airframe test beds. Cost and performance estimates were all based on paper proposals extrapolated from data collected during the prototype tests: new engines; new weights; new designs; new avionics; all on paper and all with a $15 billion market hanging in the balance for the two contractors.

This is a return to the old procurement pattern despite the now-accepted policy wisdom of a new dedication to "fly-before-buy". Yet we have the F–16 and F–18 programs with incredible overlaps in development and production. To quote Dr. Currie,

"Long lead Production Release for the F–16 is planned for June 1977, prior to testing in an operational environment".

"F–18 pilot production release would occur before testing.

Long Lead Lot III Production Release—1st quarter, 1978.

Initial Sea Trials—August 1979.

In 2½ years, we will actually *know* what the F–16 will do and cost. If experience means anything, it will do considerably less and cost considerably more.

The Navy case is even worse. After the Congress had directed the Navy to select a version of the Air Force airplane, the manufacturers proposed what the Defense Department says they considered brand new aircraft designs. Both were judged "unsuitable" as of January 1975. By May, one proposal had been massaged to the point where it became "marginally acceptable". As one DOD witness explained, it was all a matter of "judgment". I am generally inclined to better trust the military judgment on technical matters. But not when the Air Force and Navy judgments contradict each other left and right.

The Navy rejected the F–16 as "carrier unsuitable" in part because the electronic control system was judged an unnecessary hazard. It was an advantage as far as the Air Force was concerned. While a serious deficiency in the F–18 armament stored on top of folded wing tips—a first in carrier deck operations—was deemed only "less than desirable" in carrier suitability judgments.

The Air Force saw the need to recalculate the performance claims for the General Electric engine only to have the Navy fully accept the contractor's claims for a still more advanced proposed engine model.

The Navy ruled the F–16's 7.8 degree tail clearance was unacceptable—only to admit the F–14's is about half that today, 4.4 degrees.

Cost estimates shifted dramatically in the six weeks between our two hearings: Life cycle cost jumped $3 billion for the F–18, $1.6 billion for the F–16. F–18 engine development cost estimates went up from $276 million to $347 million. DOD witnesses denied knowledge of and discounted new estimates given to the committee over their own signatures.

All these arguments and more, including retractions and reversals by DOD witnesses, are documented in the record of hearings I have enclosed with this letter.

To step back from this record of confusion, there is one simple fact of the matter: neither Congressional Committees nor the military have any hardware data to substantiate estimates of cost and performance. For all the rhetoric on the need to test before making major commitments, we've again taken the easy way. The remaining development and production for each aircraft are severely overlapped so that both aircraft will be rolling off the lines before operational testing has barely begun.

To proceed as planned also means we will permanently close the door to possible cost savings through commonality. The Defense Department has already conceded that the costs of F–16 and F–18 will not be "about the same" as a common aircraft (their original testimony) but will cost "about $700 million more." The gap will grow to the billions as these programs each grow in cost.

Based on your own investigations, you know that we cannot arbitrarily impose commonality; the TFX experience illustrates that conclusion. But equally valid is the experience of the F–4 and A–7 where appropriate adjustment of the requirements led to direct savings.

Mr. Chairman, I am proposing that we buy some essential and inexpensive insurance against a $27 billion program effort. This insurance would,

Introduce a real competitive threat to the selected aircraft and provide incentives to keep costs down; and

Provide for cost savings through commonality should additional competition demonstrate that a common aircraft can meet the mission requirements of both services.

According to the Director of Defense, Research and Engineering, it would cost only $15 million in basic design effort and wind tunnel testing to design an F–16 version that could qualify for the Navy. Then, to prototype on an austere basis would take another 2 years and $50 to $80 million. Equivalent amounts should finance austere development of a land-based version of the F–18 as its development proceeds.

I have received assurances from the concerned contractors that (1) they would, in fact, be able to execute such activity for this amount, and (2) they would enthusiastically support such a challenge if both programs are to proceed anyway.

The cost of austere prototyping competition, then, could be expected to total something under $200 million over the three years. We could stop at any point that either aircraft program began to falter. We could concentrate on either one at any time. We could chose to continue into a more extensive demonstration. And in the end, we will have some firm conclusions on costs, performance and commonality for less than 1% of the total life cycle costs which are at stake. The savings could easily be in the billions.

The Defense Department's only public objection is that this proposal will cost more money *now* which, they fear, will come out of other programs. They believe competition and hardware development has been carried far enough. I strenuously disagree. Time and again, we pay more later by cutting corners at the beginning. When will we learn.

The only other common argument opposing this proposal seems to be the notion that we can never replace the F–16 in the European Consortium sales; that we are irrevocably committed. This, I believe, is nonsense.

Why should we expect the Europeans to take delivery on 348 aircraft if they turn out not to perform as promised? Why should we expect the U.S. to deliver such aircraft when U.S. companies have guaranteed a price, which, if exceeded by just 26% would match the net worth of General Dynamics? (Typical cost growth experience has been 30% according to RAND statistics). Why should we foreclose still larger foreign sales markets by *not* developing a twin-engine alternative for other European and non-European nations who may have a preference for such an aircraft? The European Consortium commitment is no deterrent, as far as I can tell.

The manufacturers, it would seem, should welcome the opportunity to prove themselves. Those members of Congress who find themselves pressed for one reason or another to make hard-over technical source selection judgments one way or the other should welcome the opportunity to let the airplanes and the tests settle the arguments over costs and performance, including comparison with the F–14 and F–15.

Mr. Chairman, I would be pleased to discuss this proposal with you at length. I have also enclosed some draft language I intend to propose. In the meantime, should the committee staff have any further questions, please contact Mr. Les Fettig, Subcommittee Chief Counsel, ext. 40211.

With best personal regards.

Sincerely,

LAWTON CHILES.

Enclosure.

ADDITIONAL LANGUAGE FOR COMMITTEE REPORT

In the Committee Report Section for:

RESEARCH, DEVELOPMENT, TEST AND EVALUATION—NAVY

NAVY AIR COMBAT FIGHTER

Add the following language:

"The Committee directs, however, that $12,000,000 and $3,000,000, respectively, of these amounts shall be used only to conduct the initial design and test activities required to develop a land-based version of the aircraft which can be demonstrated in prototype tests by calendar year 1978".

In the Committee Report Section for:

RESEARCH, DEVELOPMENT, TEST AND EVALUATION—AIR FORCE

AIR COMBAT FIGHTER

Add the following language:

"The Committee directs, however, that $12,000,000 and $3,000,000, respectively, of these amounts shall be used only to conduct the initial design and test activities required to develop a carrier-based version of the aircraft which can be demonstrated in prototype tests by calendar year 1978".

M'DONNELL DOUGLAS LETTER

Senator SYMINGTON. The letter that I would read is:

I have your note of 10 October attaching the letter of Senator Chiles to Chairman McClellan on his proposed language for the FY 1976 Appropriations Committee Report on the Navy and Air Force Air Combat Fighter. He proposes to provide prototype demonstrations of a carrier-based version of the F–16 and a land-based version of the F–18; and should this not be adopted, he proposes to delete all funds for the F–18 program and restructure the F–16.

Senator Chiles' stated objectives are: (a) more competition, (b) more fly-before-buy, and (c) commonality between USN and USAF programs.

Taking these one at a time, of course it is desirable to maintain competition. But there is already an abundance of vigorous competition as the OSD programs are now constituted. In the U.S. Air Force, the price-effectiveness competition afforded by the F–16 versus the F–15 is real and active; and later the F–18 could be introduced into USAF at the expense of the numbers of F–16s and/or F–15s should these later programs falter in the competitive atmosphere. This is precisely how the USN F–4 was procured by the Air Force in lieu of additional USAF F–105s when the latter program encountered technical difficulties. And a casual reading of the current testimony and debate on the F–18 versus the F–14 and A–7 shows there is plenty of genuine competition alive today and for many years to come to assure maximum economy and performance achievements by the suppliers of the F–14, F–18 and A–7. Both the F–14 and A–7 are committed to production through 1979, hence unquestioned open competition exists within the USN for the next four years. In addition, four programs, namely the F–14, F–15, F–16 and F–18, will compete vigorously to fulfill the fighter needs of our allies in the years ahead. Senator Chiles' alternative proposal, deleting F–18 funds should his proposed language not be adopted, obviously seriously reduces competition—actually eliminates all competition with the F–16 for the low portion of the high-low mix.

The Senator's second goal of more "fly-before-buy" is laudable in general. But as to specifics, the F–18 program as proposed by OSD provides more fly-before-buy than any jet fighter program of the last two decades. Using the successful F–15 program for reference, there was no competitive prototype aircraft but technical confidence was achieved by technology prototypes for the engine and the radar, followed by a technical demonstration milestone management that coupled decisions to proceed with meaningful increments of technical achievement. The F–18 is patterned in the same manner with two additional major features:

(a) There were competitive prototype airplanes to provide solid aerodynamic, propulsion, flying qualities, and cost data before the start of full-scale development.

(b) A more conservative F–18 full-scale development and production build-up delivers the 100th airplane 91 months after go-ahead versus 78 months for the F–15—over a year later with the added benefit of two prototype airplanes.

Finally, on the subject of commonality, its purpose is to reduce cost. As Dr. Currie testified, the decision by the Air Force in favor of the F–16 prior to the U.S. Navy decision was approved by OSD because it would be more economical to procure F–16s for USAF and F–18s for USN than F–18s for both services due to the basically smaller and more economical design of the F–16. In this case, commonality was not meritorious unless achieved by the F–16 for both services. The outcome of the USN evaluation of the F–16 carrier versions showed very little commonality with the Air Force versions besides not meeting the basic requirements of the Navy mission. This result is hardly surprising. Both of the successful common USN/USAF programs in the recent past, the F–4

and A–7, originated with the USN for the simple reason that the USN requirements are tougher; and, once satisfied by a design, that design can be introduced into Air Force inventory with relatively little change if the lower fighter performance and higher costs flowing from the Navy requirements are competitive with other alternatives and, most important, if the performance is superior to the threat. The one major effort at a joint USAF/USN program, the F–111, resulted in a USN design (F–111B) that diverged from the USAF design and that was, in the final analysis, unacceptable in the USN role.

In summary, Senator Chiles' objectives of fly-before-buy and competition are being achieved by the OSD proposed programs; and, in fact, deleting F–18 funds would drastically lessen competition. In addition, the cost benefits of commonality between USAF and USN programs are illusory and not achievable in the current situation, so that we heartily recommend implementation of the F–18 program as proposed by the Navy and OSD and approved by the full House of Representatives.

ANALYSIS OF SENATOR CHILES' LETTER

Now, Mr. Chairman, I would ask unanimous consent that a detailed analysis of the letter from Senator Chiles be inserted in the record.

[The analysis follows:]

ANALYSIS OF SENATOR L. CHILES LETTER TO CHAIRMAN MCCLELLAN, DATED OCTOBER 7, 1975

Page 2, Paragraph 1—

The "competitive threat" already exists by virtue of having an F–16 and an F–18; also by having an F–14 and F–15. Secretary Currie has stated to the McClellan Defense Appropriations Subcommittee on May 6:

"Mr. Chairman, there are two other very significant points to be made in the development of the F–16 and F–18. One is the importance of having options in future defense planning. One great benefit of the high-low mix approach is that having both types of aircraft in production simultaneously provides us the opportunity to increase or decrease the production of either in proportion to changes in the emerging threat. Second, we have found that there is nothing so effective in holding cost down as the existence of on-going competition between manufacturers. Development of the F–16 and F–18 provides a stimulus to keep costs down on the F–14 and F–15, while the existence of the F–14 and F–15 assures that the costs of the F–16 and F–18 cannot increase very much. Moveover, both the F–16 and F–18 in some measure compete with one another—while also providing two important options for additional foreign sales. To be able to achieve this level of competition in our fighter aircraft is a situation we have not had for over twenty years—and is now available with virtually no increase in the overall cost of ownership. This is an opportunity for the American business tradition to work by itself—I feel the pay-off will be substantial."

As to the F–16 and F–18 having been a "paper competition" it is a fact that both of these aircraft have proceeded to the point of full scale development from a *real hard* data base—each aircraft flew over 300 flights—each aircraft was flown against other aircraft. They were both evaluated by Air Force and Navy pilots.

Page 2, Paragraph 5—

It is difficult to understand how one can say that "there never was a well thought-through decision on the military need for these two new programs." Congress and DOD have been discussing the necessity for a high low mix for fighters for several years and Congress has been directing the services to work in this direction. The Navy convened Fighter Study Group IV to determine the need for a lightweight fighter to complement the F–14, and replace the F–4 and A–7 aircraft. This Fighter Study Group, like its predecessors that had been convened for consideration of major weapon systems, such as the F–14 and A–7, evaluated the threat, Navy roles and missions and surveyed fleet operators to determine the operational requirements that would determine the characteristics of the new VFAX airplane. These requirements were satisfied by the F–18 design, by painstaking competent and technical NavAir evaluation, supported by the GAO investigation.

Page 3, Paragraphs 3 and 4—

In regard to overlaps in development and production quoted on the F–18 program: The pacing of the F–18 program is slower than the F–16 and slower than the F–15. The pilot release referred to is only for six aircraft, hardly a commitment for significant production rates. Delivery of the first engine for these *pilot* production aircraft does not occur until the middle of 1980, by which time the engine will have accumulated approximately 25,000 test hours—including 10,000 flight test hours.

The following table portrays the Development/Production overlap risks involved in the programs in question compared to actual F–15 experienced and planned acquisition schedules.

	Months from go-ahead to 1st flight	Months from go-ahead to delivery of 100th production aircraft	Months to build to 9 mo from 1st production delivery
F–15	31	[1] 78	[3] 18
F–16	[2] 24	65	13
F–18	33	91	41

[1] Will be actual in August 1976.
[2] Will be actual in May 1976.
[3] Scheduled December 1976.

Page 4. General—

Senator Chiles has presented several examples where he feels that the Air Force and Navy judgements contradict each other. Comments that follow clarify the examples he presents. However, it should be realized that the several examples relating to the rejection of the F–16 by the Navy evaluators represents even less than the tip of the iceberg. Hundreds of Navy evaluators spent months evaluating many hundreds of technical details. It is not surprising that different judgements would be rendered by the two services when it is realized that the requirements for carrier operability are far more stringent than those for land operation. Not only were these data judged by the Navy during their evaluation, the GAO oversaw their evaluation and additionally in the course of exchange of correspondence relative to the LTV protest, the Navy provided the GAO with great detail relative to the evaluation and invited the GAO to review the many files of relevant data.

Page 4, Paragraph 1—

As stated by the Navy and reiterated by the GAO in their rejection of the LTV protest: "Rejection of the three LTV designs was based on unsatisfactory ratings in the performance area, particularly combat performance, and overall carrier suitability". Senator Chiles' letter suggests that the electronic control system used in the F–16 was judged by the Air Force to be an advantage, whereas the Navy had judged it an unnecessary hazard. The Air Force F–16 ACF does not incorporate the same electronic control system modifications that were proposed in the LTV designs for the Navy Air Combat Fighter. The Navy evaluations considered the LTV modification to the F–16 electronic control system as a jury rig to overcome an unsatisfactory characteristic which, if incorporated, would create an unacceptable hazard.

Page 4, Paragraph 2—

The Navy has testified that engine experts from the Aeronautical Systems Division of the Air Force Systems Command, Naval Air Systems Command, Navy's Propulsion Laboratory in Trenton, N.J., and the Department of Defense have all validated the performance of the F–404 engine.

Page 4, Paragraph 3—

The Navy's response to the GAO relative to the LTV protest states that the F–14 has an unacceptable rate of structural damage at landing due to tail down landing attitude angles. Based upon the experience of this and other aircraft, the Navy established an angle necessary to achieve acceptable tail clearance. The F–16 NACF variants failed to achieve acceptable clearance. The F–18 satisfied this criteria.

Page 4, Paragraph 4—

Since the award of the sustaining engineering contract to MDC there have been numerous cost estimates in the news media suggesting one alternative or another was less expensive than the F–18 and in some cases were inserted into

the Congressional Record. Probably the most controversial one pertaining to cost was one alleged to have been an OMB paper. This was one of several OMB drafts of a working paper, prepared for review with OSD for the FY 77 budget preparation cycle. Following coordination of the final working paper between OSD and OMB, the OSD ratified the decision to continue with the F–18. We do not believe that the Navy's cost estimates for the F–18, including the engine, have changed in any significant degree since the initial award and was reported to your committee on the LWF hearings of 6 May.

Page 5, Paragraph 4—

Neither MDC nor GE assured Senator Chiles or his committee that they would be able to execute such activity for the amount noted nor that they would enthusiastically support such a program.

Page 6, Paragraph 3—

Foreign sales of the F–18 are not foreclosed by continuing with the DoD's recommended plan. Dr. Currie has stated that the F–18 has foreign sales potential.

AIRFRAME WEIGHT

Senator SYMINGTON. Then I would ask a question of Senator Goldwater. The Secretary of Defense talked to me about this plane and I asked about the weights. Senator Goldwater knows a lot about airplanes and I know a little myself, especially about their purchase and the prices and the problems of airframe weight.

It is my understanding, according to the Secretary of Defense, that the weight of the F–14 is about 62,000 pounds, counting the Phoenix missile, and that the weight of the F–18 is around 33,000 pounds as against 62,000, counting the Sparrow and Sidewinder.

I would be interested—I have not, for some reason, been able to get the costs on these planes. It was difficult last year; Admiral Houser has tried hard to clear me up on it after the first hearing we had in the Tactical Air Subcommittee; but it seems to me incredible that people would imply that there is not much difference in cost when there is a difference between 33,000 pounds for the F–18 with missiles as against 62,000 pounds for the F–14 with missiles.

I would ask the able Senator from Arizona, who is knowledgeable on aircraft matters but who, I know, also realizes that the gentleman who wrote this letter is knowledgeable—I would ask him to comment on the points brought up, which are, in effect, the same points that he brought up in his talk.

Senator GOLDWATER. The combat weight of the F–18 is approximately 29,000 pounds.

Senator SYMINGTON. Before putting the Sparrows and Sidewinders on.

Senator GOLDWATER. The total take-off weight is 33,000 pounds.

Senator SYMINGTON. That is what I said.

Senator GOLDWATER. The F–14 total take-off weight is 58,200 pounds.

Senator SYMINGTON. I think you will find that it is higher, according to the Secretary of Defense if you add the Phoenix missile.

Senator GOLDWATER. That is with internal fuel, two Sparrows and two Sidewinders. That is on the F–14.

F–14/F–16/F–18 COST COMPARISONS

Now I wish I could give the Senator an answer to the cost problem. He requests that when we started this whole talk about lightweight fighters we were talking of being assured by all of the manufacturers competing that we were talking about an aircraft in the

neighborhood of $3 million to $4 million. The F–16—I will supply for the record the latest cost on the F–16, but it is away above the original figure. The same is true with the F–14, although the F–14 in the last 2 or 3 years has been maintaining a pretty good constant cost. The F–18, and it is a matter of record, the $7 billion I talked about without any inflation factor compared to the $8 billion of the F–14 total cost, with the inflation factor. So I think we are talking about something that is—I now have the figure for the F–16, it is $6.3 million a copy. That is twice what we were talking about when we started.

Senator SYMINGTON. I never heard of a $3 million fighter.

Senator GOLDWATER. We talked about them in the Tactical Air Committee.

AIRFRAME WEIGHTS AS A COST BASIS

Senator SYMINGTON. Well the point I would like to make, does the Senator think there can be any comparison between the cost of 33,000 pounds of airframe weight plus missiles and the cost of 62,000 pounds if you add the Phoenix or 58,000 pounds if you only add the Sparrow and Sidewinder for the F–14. We are getting down to the cost effectiveness in this and I haven't been able to get all of the figures, and I have tried hard to do it.

But when you have an airplane that is almost half of the weight of another, to say that the costs are comparable, to me is just incredible.

Senator GOLDWATER. It is a matter of record, Senator. I would like to know myself why this is so. I can tell you one of the reasons that we got into this.

I think Senator Chiles can probably testify on these costs better than I. His figures show that the F–14 is an $8 billion program, and the F–18 is a $7.2 billion program.

We have the problem of black boxes, and we have the problem of the expensive Phoenix system. These are all factors that are different than when the Senator was in the aircraft manufacturing business or component business. It is different than when I first started to fly. Weight had a lot to do with it but today it depends on the sophistication you want to put in.

Senator SYMINGTON. Senator, wouldn't you say the sophistication of the F–14 are more complex?

Senator GOLDWATER. I am merely giving the figures compiled by the record. I would like to say that I would disagree with them but with the experience we have had in aircraft procurement over the last 20 years, I can't say that I am going to disagree with these figures.

F–18 PERFORMANCE EXPECTATIONS

Senator SYMINGTON. Let me ask the Senator another question. He was at the hearing, and I had to Chair the hearing, and Senator Cannon had to be on the floor, but then I had to go to another hearing. I didn't hear Mr. Spangenberg. He said "the F–18 has no more capability than the F–4." Would the Senator agree with that?

Senator GOLDWATER. Well, of course, nobody is flying the F–18.

Senator SYMINGTON. They convinced me they could make the engine and they have made it, and I think the Senator will agree the F–15, even though it does cost more is the finest fighter in the world today.

Senator GOLDWATER. I won't buy that last statement. I think the F–14 with certain configurations will outperform the F–15, but that is beside the point.

Senator SYMINGTON. With the current engine?

Senator GOLDWATER. That is the aircraft and the engines that they now have.

Senator SYMINGTON. Mr. Chairman, I have no further questions. I will let the record speak for itself.

Senator GOLDWATER. I would like to answer the Senator's statement about the F–4. Nobody can say, but I would certainly think that the F–18 could outperform the F–4E. In fact we would be doing wrong if we tried to build an aircraft that wouldn't outperform the F–4.

Chairman MCCLELLAN. Senator Hruska, do you have any questions?

Senator HRUSKA. Not at this time.

Senator STEVENS. Could I ask one question. You are actually supporting the funds for the F–16, is that correct?

Senator GOLDWATER. Oh, yes. The F–16 is a production aircraft, or soon will be. We are not arguing whether we are going to buy it or not. It is in procurement stages. I am not arguing against the concept of the F–18. I am just arguing that it should be done in a different way, and I think the Navy will get a better fighter.

Senator SYMINGTON. I may add one more point and then I am through. The Secretary of Defense told me that the cost on an equal basis of the F–18 was around 55 to 60 percent of the cost of the F–14, and the Navy wants the F–18. I think I had more to do with putting the F–4 in the Air Force than any single person, and I ran into direct conflict with the present Chief of Staff of the Air Force, because to me it was clearly a superior airplane to its competitor, the F–15. My interest in this is the cost effectiveness aspect of a plane that I think will end up by costing a great deal less, and for some reason we can't get the figures on it.

Thank you, Mr. Chairman.

CONCEPT OF COST EFFECTIVENESS

Senator GOLDWATER. I don't agree completely with the concept of cost effectiveness. I think that was the most devastating thing that Mr. MacNamara left us saddled with. There is no way you can argue about it.

Senator SYMINGTON. It was not cost effectiveness that got MacNamara in trouble. It was commonality. That is one of the things that is being proposed in this situation—commonality. The requirements of the Air Force are different than the requirements of the Navy and the requirements of the Navy are different than the requirements of the Air Force, and when MacNamara bought it from Harold Brown that you could make one airplane to do everything, he cost the American taxpayer probably more money than anybody has done at any time.

Senator GOLDWATER. The Senator was out of the room when I made the same statement. There is no way you can take an aircraft out of Air Force inventory and say it is going to be a commonality fighter. You can start, though, and develop a common core which is something we have never done.

Chairman MCCLELLAN. We have a rollcall vote in the Senate Chamber, so we will take a short recess.

[Voting recess taken.]

STATEMENT OF HON. LAWTON CHILES, JR., U.S. SENATOR FROM FLORIDA

Chairman McClellan. We will proceed.

Senator Chiles, I believe you are our next witness. Do you have a prepared statement you want to read?

Senator Chiles. I want to try to go through it if I can. I want to first extend my thanks again for the opportunity to appear before the subcommittee. During the 5 months since my last testimony, I have had a chance to develop some specific conclusions on the air combat fighter programs through a review of this committee's work and hearings before the Senate Tactical Airpower Subcommittee and my Government Operations' Subcommittee on Federal Spending Practices.

As you know from my letter of October 7, I would like to propose a middle-ground option for the committee's consideration. My proposal is that we continue the F–16 and F–18 programs, as requested, but at the same time, conduct a demonstration of a carrier-based F–16 prototype and a land-based F–18 prototype over the next 2 or 3 years.

What I am proposing is that we be skeptical and hold open our options until we see some hard evidence on what these new programs will offer us in terms of cost and performance. If the F–16 and F–18 develop as promised, we have lost nothing. If they do not, we will create some attractive options while we learn enough to settle the conflicting arguments over the F–14, F–15, F–16, and F–18.

I believe this route is better than any of the other options being put forward for killing, substituting, or starting new airplanes—not necessarily because one of them may not turn out to be best but because we cannot know which is best today.

I would like to spend a few minutes to review how I see three areas: (1) The background on these programs—how we got where we are today; (2) other proposals for changing these programs; and (3) my proposal for continued cross-over competition.

BACKGROUND

Let me first say I am no aircraft expert. My concerns stem from my responsibilities in procurement reform. Since I replaced Senator Jackson as a member of the Congressional Commission on Government Procurement in 1971, I have tried to learn a few basic lessons about what has been right and what has been wrong with our weapons acquisition process. Since 1973, the Federal Spending Practices Subcommittee has been working to put the Commission's reform package into effect. Based on hearings this summer, the Office of Management and Budget has agreed to do so through a new OMB policy circular due to be issued in December.

I don't want to spend a great deal of time reviewing how we reached this situation today. Some pertinent details are spelled out in my October 7 letter and this committee has taken an excellent record of testimony.

In summary, let me just say that, up until this point, these programs have not matched the recommended acquisition pattern of the Procurement Commission.

Front-end mission decisions were badly scattered.

The programs grew from the bottom up.

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Congress again intervened where it should not have because there were no better early opportunities.

The program was rushed by an extra year to satisfy the Europeans.

Development will be badly overlapped with production, leaving only skimpy test and evaluation.

All these characteristics point to trouble, in the Commission's view. If you look at this past history, it was when we had these problems, overruns would result. My proposal would try to ease these programs back into a more solid procurement pattern, if nothing else.

OPTION 1: DO NOTHING, CONTINUE BOTH

This poor acquisition pattern is mainly why I would argue against the first option open to the committee; namely, do nothing: Let both the F–16 and F–18 proceed untouched. This kind of program is why I would argue against the first option because that would be allowing them both to proceed untouched. We can read all of the letters that we want to, and I can tell you of course all of the companies involved want that, because they have all got their pieces of the action now and they have all got their plane, and that is exactly what they want. I think that is really what the Air Force wants, and what the Navy wants. They have their planes now.

I think we have learned enough from experience not to put any great faith in the performance and cost promises for programs at this stage of early development. It's nobody's fault, but we simply are not smart enough to predict these things before thorough test and evaluation.

And the particular cost confusion on these programs seems to confirm that skepticism.

UNRELIABILITY OF COST ESTIMATES

With overrun after overrun, we should recall that back in 1970, everyone finally said, "We should have known better than to believe those estimates. Let's from now on run independent estimates to check ourselves." Now, in 1975, you have to drag out those independent estimates only to have them denied and excused away by senior DOD officials.

First, life cycle cost estimates:

	Billions
F–16:	
Advertised	$8.7
OSD Independent	9.8
F–18:	
Advertised	13.7
OSD Independent	16.9

In public hearings, we were told the differences were purely a matter of overhead accounting and operating periods, having nothing to do with the cost of the aircraft. In answers for the record, however, we were then told for the F–18 that differences between the two figures result from OSD's higher acquisition cost estimates.

When we then asked for a specific apples-to-apples comparison to clear up the confusion, we were told:

> We would prefer not to provide a detailed breakdown. Since we believed the details of the $16.9 billion calculation may no longer reflect the OSD view of the costs of the F–18 program—and since that program itself may be revised

as a result of the DSARC review—we will defer presentation of further detailed information.

I am not surprised at this reluctance because, as I have stated, we have had only a limited paper competition. There is still no F–18 and the cost and performance figures are as soft as the lead in a pencil. Admiral Houser confirmed this before the Armed Services Subcommittee 2 weeks ago when he testified on what has been happening for the last 2 months and why the DSARC review has been repeatedly delayed. He said, "We have conducted approximately 150 trade studies and decided what kind of airplane we would like to propose to the DSARC."

ENGINE DEVELOPMENT COSTS

As for the engine, our subcommittee received three different estimates of development costs:

	Millions
Advertised	$301
Navy Independent	325
OSD Independent	347

We were told in May that this F–404 engine would have 17 percent more thrust than the predicted thrust of the J–101. Now, the Navy has testified it will have between 8 and 15 percent more thrust depending on the conditions. In the meantime, I understand the Air Force has taken a separate look at the proposed engine and doesn't agree with the Navy that they should accept all the claims at face value.

Mr. Chairman, I know virtually nothing about engine or aeronautical science, but I think I do know when people are making guesses. Most of our recent major weapons programs have been built of guesses. That is the essence of the argument I would make against the option of simply letting these programs go on as planned. It is also a key argument, I believe, in favor of my proposal to hold open options.

Let's take the F–14 as an example. Look at what we were told we were getting and look what we got.

F–14: PREDICTIONS AND FINAL RESULTS

Compared to the original Navy requirements the contractors guaranteed to meet, the F–14 actually:

Came in nearly 5,000 pounds overweight.

Missed its predicted 9.5° tail clearance angle, wound up at only 4.4°, which meant its carrier approach has to be changed to prevent tail bumping.

Missed its combat patrol endurance by 15 percent.

Missed on required maintenance and reliability.

Missed the required combat ceiling.

Missed the wind over deck required for approach.

Managed to meet required ranges after 2,000 pounds of fuel were added.

And the original advertised cost was soon forgotten after Grumman threatened to close down production.

Now, despite violating all these so-called requirements, we are today told at the same time the Navy is tremendously happy with the F–14. Some argue we should buy more. We are also asked to accept that the F–18 is the only acceptable airplane because the others didn't quite meet all requirements. Finally, we are asked to believe all the cost and

performance numbers touted for the F–18, and that they will come out just as was said.

Without being an expert, all of these pleas just don't make sense together. It just seems to me that we better reserve commitments based on what we're going to get, not on what we hope we'll get. My proposal would permit us to do that.

OPTION 2: CANCEL F–18; BUY MORE F–14'S

One other option that's being prominently pushed is to kill the F–18 and buy more F–14's instead. That may or may not eventually make sense, but to do so today is entirely uncalled for, I believe.

The F–14 production line isn't going to be shut down. In the meantime, let the F–18 program continue if only to provide the options for other foreign sales. But I think it does much more than that. The vast bulk of the foreign countries are yet to be heard from, many of which have in the past expressed a strong preference for a twin-engined, land-based fighter.

At the same time, we'll find out more about just what the F–18 will do and cost. Plus, under my proposal, we could proceed to develop a new engine the Navy says they will need for the F–14 anyway.

There's another thing that's awfully curious about these arguments to go back to substitute the larger, "more capable" Grumman F–14 instead of buying smaller F–18's. The same arguments should, theoretically, apply to the F–15 and F–16. On August 16 last year, the president of McDonnell Douglas wrote to Secretary Clements offering to produce 300 more F–15's at a $5.8 million unit flyaway cost instead of a lightweight fighter. That offer was made before McDonnell Douglas won the Navy F–18, however, and since then we haven't heard much about the unsolicited proposal which was made.

OPTION 3: CANCEL F–18; HOLD NEW COMPETITION

Another option the committee could consider is to cancel the F–18 and hold a new competition. I can't see that for a couple of reasons.

Ever since the last Navy fighter program—the F–14—went a little off target, the whole force structure has been undercut. The Navy contends that the current F–4 Phantoms simply won't last much longer and that, by 1981, they won't have enough fighters to outfit the carriers.

I don't think a brandnew competition could provide new aircraft in time unless it was severely rushed. Plus, the Navy contends they wouldn't get much better proposals than those they received.

I would prefer to see us take advantage of what we've paid for up to this point but keep some competition in step with the F–18.

OPTION 4 (MIDDLE-GROUND PROPOSAL): CONTINUE BOTH; INTRODUCE CROSSOVER COMPETITION

As I have stated, Mr. Chairman, I would like to propose that the committee consider a positive, middle-ground option that would take advantage of how far we've come today yet hold open some safeguards.

According to the Director of Defense, Research and Engineering, it would cost only $15 million in basic design effort and wind tunnel

testing to design an F–16 version that could qualify for the Navy. Then, to prototype on an austere basis would take another 2 years for a total of $50 to $80 million. Equivalent amounts should finance austere development of a land-based version of the F–18 as its development proceeds.

I understand that the concerned contractors would, in fact, be able to execute such activity for this amount.

The cost of austere prototyping competition, then, could be expected to total something under $200 million over the 3 years. We could stop at any point that either aircraft program began to falter. It may be that you would invest $15 million and then you would see that at that point you wanted to stop one of the competitions. We could concentrate on either one at any time. We could choose to continue into a more extensive demonstration. And, in the end, we will have some firmer conclusions on costs, performances, and commonality for less than 1 percent of the total life cycle costs which are at stake. The savings could easily be in the billions.

OBJECTIONS TO CHILES PROPOSAL

One objection is that this proposal will cost more money now which, the DOD fears, will come out of other programs. They believe competition and hardware development has been carried far enough. I strenuously disagree. Time and again, we pay more later by cutting corners at the beginning.

Another opposing argument says that there can never be a carrier-suitable F–16 version. That's not true. In the first place, the F–18 itself was judged only "marginally acceptable." The Navy concedes it has begun investigating seven substantial design changes to keep the already too high carrier approach speeds from getting worse.

A new F–16 design, with less commonality, can be acceptable to the Navy. Dr. Currie has said so. Navy representatives have said so in private conversations. A Navy version of the F–16 could be even more attractive if some of the mission requirements were relaxed to give it cheaper avionics, a change that is being considered right now anyway for the F–18 DSARC review.

I am not saying common F–16 versions is necessarily the best way to go—but it could turn out to be attractive if other things don't come through according to plan.

Another argument against my proposal is that we will never want both Air Force and Navy both flying F–18's—it will be too costly, giving the Air Force far more capability than they say they need. But that is a thin argument because the OSD commonality report of last July shows the total life cycle costs of common F–18's is only about 1 percent more expensive than what they are doing now—buying both F–16's and F–18's. That analysis cautioned the numbers were only good to about 2 percent anyway. So, the final argument used was, "There might be an inescapable tendency, on the part of the Air Force, to add more expensive equipment to the larger, more spacious, F–18 airframe."

When the Pentagon resorts to marginal arguments like that, I get an uneasy feeling.

EFFECT OF PROPOSAL ON EUROPEAN SALES

The only remaining argument that really concerns me—and I know it does you, Mr. Chairman—is the effect on the sale of 348 aircraft to the European consortium—Belgium, Denmark, Norway, and the Netherlands.

I have heard arguments on both sides and I would like to hear more during the time before the committee reaches a final vote.

On the one hand, I can see the argument that any proposal to hold open options—even though the F–16 program continues—would nevertheless undermine confidence in the Europeans. We have to recognize that the European's choice of the F–16 over the French Mirage was not an easy one for those four governments.

Given our balance-of-payment and unemployment problems, I and this committee would not be serving the American people if we took any actions to unnecessarily jeopardize those sales. I don't want to do that. If the Senate took any action that would quickly and surely drive the Europeans to buy the French Mirage, I would have to reconsider the extent to which we continue competitive options.

On the other hand, I have heard arguments that my middle-ground proposal would, first, not jeopardize European sales, and second, these sales don't matter anyway in the larger scheme of things.

First, you could argue my proposal would do absolutely nothing to disturb the F–16 program as long as everything goes according to plan. The Europeans have already been told formally by the Defense Department that, and I quote, "Production quantities and schedules are dependent upon success in the development programs from a performance and cost standpoint. Final execution of these plans is dependent upon congressional approval which, under U.S. Government procedures, must be sought on an annual basis. In discussion with key congressional leaders, they have assured the Department of Defense of their support in obtaining the required approval of Congress for the air combat fighter program."

If the Defense Department has told as much in writing to the Europeans, you could argue that my proposal would not undermine confidence but, on the contrary, all concerned should welcome the safeguards of alternative, lower cost fighter options. There may be no adverse impact on the European commitment whatsoever. Then, there are the arguments that the European sales are no great bargain for the United States anyway:

DETAILS OF FOREIGN SALES ARRANGEMENTS

American, not European taxpayers are going to bear the brunt of whatever the program will cost in the end.

The Europeans will build 10 percent of all our F–16's in exchange for our building 40 percent of theirs. If we sell more than 2,500 F–16's, the Europeans will be taking jobs away from Americans. We have sold over 4,800 F–4 Phantoms. Estimates of sales to Iran, Germany, and the total Air Force F–16 buy exceed 2,200.

European industry will benefit tremendously from the inflow of American technology. Even if we make the sale this time around, training foreign companies to produce high technology hardware will come back to haunt us later.

The Europeans struck a tough bargain, covering everything from Belgian machineguns to liquid gas tankers. In sum, there are serious arguments over jeopardizing European sales. To say the least, I want to hear more. I would like to hear from the Ambassadors of the four European countries as to whether or not adopting my proposal means they would switch to the Mirage.

I would like to hear more about which key congressional leaders assured their support over a year ago and I would like to discuss the reasons with you and whoever else gave such assurances.

I would like to review the commitments made in Deputy Secretary Clement's letter of July 11, 1974, and Air Force Assistant Secretary Schrontz' letter of August 21, 1974.

SUMMARY

To summarize my proposal, Mr. Chairman, I am only arguing that we could buy a little time and information as these two programs proceed along their current plans.

If it turns out they both cost more and do less than promised, we can always buy more F–14's and F–15's.

If only one falls flat, we still have kept open some attractive options for common Air Force and Navy aircraft, something we can all support if we look at a list of how many different kinds of weapons we now have.

If both air combat fighters turn out as good or better than predicted, we can proceed to buy them both according to plan. We have disturbed nothing, but in the meantime also bought another engine option and options for other foreign sales where there is already foreign interest.

And, I believe, the modest cost of doing all this is more than worth it in the long run from a pure procurement standpoint.

Even if a poker player has the winning hand, I would prefer to pay $1 to see it before he takes a $100 pot—especially if he has a well-earned reputation for bluffing.

The F–14 and F–15 aren't going to disappear. And both the F–16 and F–18 programs can proceed along development to try to keep the promises that have been made. But we will be hedging our bets, putting in some hard competition, holding open our options. That is all I am proposing.

Mr. Chairman, I offer these views to be of assistance to the committee. I, like you, have been concerned over the foreign sales argument. I would like to be convinced that my proposal, first, seriously jeopardizes European sales and, second, that these sales are really that important before I would reach any other position.

Beyond that, if my proposal cannot be accepted I would have to reserve judgment.

I would be glad to discuss this problem further and, whatever your decision, to offer whatever support I can.

Thank you, again.

Chairman McCLELLAN. Thank you, Senator Chiles.

If I understand you, you would simply continue the competition between the original competitors until we get prototypes and can make the comparisons and evaluations?

CONTINUED DEVELOPMENT OF BOTH PROGRAMS

Senator CHILES. I would just keep it going so that you keep it alive and you just see whether these overruns will develop. It seems like to me if each aircraft can do what it is proposed it can do, next year we will have spent $15 million apiece perhaps on these aircraft. I think we will be able to be much further along and see what they are doing and determine then, do we want to extend it any further, and do we want to stop one of them then, and do we want to lock them both in. You won't be delaying the actual production of these planes at all. We would simply be keeping our options open and making sure that we are not running into the overrun.

Chairman MCCLELLAN. So you would continue developing both planes, continue the competition for a year?

Senator CHILES. That is correct.

Chairman MCCLELLAN. Thank you.

Senator Young, do you have any questions?

Senator YOUNG. I don't quite understand the competition you are suggesting.

Senator CHILES. What I am saying is you would not just lock the F–16 into production as being the plane that is going to be the Air Force plane, and the F–18 as being the Navy plane. You would spend $15 million on the F–18 additional money and go along with everything else you are doing, and because these planes are going to come on line in the 1980's—you are not stopping anything in effect.

What you are saying is you are going to do some wind tunnel tests on the 16 to determine whether you can make it carrier based, and whether you can develop a carrier capability. At the same time you would spend a little money on the 18 to see whether you can suit the Air Force requirements. At the same time you are getting further, as they get further along in their design, the figures begin to harden up of what the actual costs of production are going to be, and you haven't shut anything off.

Senator YOUNG. Thank you.

Chairman MCCLELLAN. You don't mean for LTV to continue trying to develop a Navy plane?

Senator CHILES. No, sir.

Chairman MCCLELLAN. Except to take the two as the potential contractors and have them further develop their plane before locking them into production. That is what you mean?

DELAY TO NAVY PROGRAM

Senator CHILES. That is correct. I don't think that the F–18 ever really had good competition as they went to that design, and I don't believe that. But I do kind of think that I buy the Navy's argument that to start over again on a new Navy plane would delay them sufficient that I think you would almost have to make the decisions to go with buying the 14's, because the Phantoms are weighing out, and when you make that kind of size buy that you would have to make to replace the Phantoms, you might as well say you can go with 100 of the 14 aircraft.

Chairman MCCLELLAN. Senator Pastore, do you have any questions?

Senator PASTORE. I quite agree with you that there is quite a lot of

guessing that goes into some of these developments, but I am a little bit concerned about the guess on the fact that we are not playing right in the hands of the manufacturers of the Mirage with your proposition. Could you be a little more specific about that?

You talk about talking to four Ambassadors. You don't know how far you would get with them, but the point I make is that unless you definitely make a decision in due time and get into production, don't you think that we are jeopardizing the ability to sell these planes abroad?

Senator CHILES. Well, I think that could be a legitimate argument. I would like to hear more on that.

Senator PASTORE. I would like to hear more on that.

Senator CHILES. I don't say that that couldn't be a legitimate argument.

Senator PASTORE. Because we thought we did score when the Belgians bought our plane.

SALE TO BELGIUM

Senator CHILES. I think so, and I think the Belgians tried pretty hard with us and got a pretty good deal. I think the reason that the Belgians decided finally they would go with our plane is because they wanted the new technology. The Mirage is no new technology. It is an old plane. It is an old engine, and they are not developing anything new.

Now, when they get our engine, and they get the plants over there that they are going to get, they are getting the latest technology. So there is a quid pro quo, and a very good one for them.

Senator PASTORE. Do you think we could actually determine the overrun structure merely by going up to the prototype?

Senator CHILES. Every step that you can go you get harder figures, much harder figures, because you start solving what can be the problems that come up.

Senator PASTORE. I know you get harder figures, but do you get figures that are hard enough?

Senator CHILES. Well, you cut down the probabilities tremendously as you go ahead, if you go further.

Senator PASTORE. You see your prototype costs always are tremendous because there you are experimenting, and innumerable things could happen. When you get into actual production, and your production line is accentuated, the cost begins to come down somewhat. Because therein lies the saving if there is going to be any saving at all.

I think this is a fine presentation that I think is provocative, and I would like to hear the rebuttal to it.

OPPOSITION TO CHILES' PROPOSAL

Senator CHILES. I am sure that you will.

It is a good proposal that the Navy doesn't like, and the Air Force doesn't like, and McDonnell Douglas doesn't like, and LTV doesn't like. And I haven't found anybody that likes it.

Senator PASTORE. But you like it.

Senator CHILES. That is why I think it is pretty good.

Senator PASTORE. I want to congratulate you. There is a lot of thought that has gone into this.

Thank you very much.

Chairman McCLELLAN. If there are no further questions, thank you very much, Senator Chiles.

PREPARED STATEMENT OF SENATOR JOHN TOWER

Our next witness is supposed to be Senator Tower. He is not here, but he has sent his statement which will be inserted in the record at this point.

[The statement follows:]

STATEMENT BY SENATOR JOHN TOWER (R-TEX.) ON THE F–18 AIRCRAFT PROGRAM

Mr. Chairman: Thank you for granting my request to make a statement on the F–18 program. I do have some points for consideration I want to leave with the Committee on this most important matter.

We all know that the three LTV/General Dynamics proposals submitted during the competition were judged as *not* being carrier suitable. I think it is also widely known that the LTV Aerospace Corporation has a long and distinguished career in building Navy aircraft. I do not believe anyone would dispute the point that LTV is fully aware of what is required to make an aircraft carrier suitable. Yet all three of their proposals were judged not carrier suitable.

Mr. Chairman, in trying to sort this out, one possible conclusion I come to is that the F–16 was not the baseline from which to start in order to get a carrier suitable fighter. I questioned Admiral Houser on this point and asked him if, in his opinion, any derivative of the F–16 could have been made a carrier-suitable aircraft. Admiral Houser's reply, in part, was:

"From the report that Admiral Lee provided to the CNO, which I had the privilege to see, and we discussed it several times, there does not appear to be any that would be carrier suitable."

To be totally objective about this, I do not believe Admiral Lee agreed completely with Admiral Houser.

However, my point here is that the Congress, in cancelling Navy's VFAX program and directing Navy to select a derivative from the Air Force lightweight fighter program, may have severely restricted the quality of the aircraft that Navy could get.

Therefore, Mr. Chairman, I believe the question is whether the Navy, from the way this program has evolved, is now getting the aircraft it needs. In spite of some Navy testimony to the contrary, I do believe that is the case.

I would like now to make a few comments relative to the attack version of the F–18.

Navy has testified that the A–18 will replace the A–7E force between 1985 and 1990 and that the A–18 can be expected to have an operational life of from 15 to 20 years. Mr. Chairman, I question that the A–18, as it has been described, and with its apparent limited growth potential, will be able to handle the attack mission through that time period. I believe we have learned from experience that as the threat increases and as defenses become more difficult, it has been necessary to specialize our weapon systems in order to be successful against a target.

During our Tactical Air Power hearings on the F–18 we were privileged to hear Captain Thomas Watson, an A–7 pilot and former Air Wing Commander from the CONSTELLATION. In commenting about the A–7 and requirements for future attack aircraft, Captain Watson said:

> "And when you look into the future, and I think we are looking ten, twenty years from now in airplanes, we must have more agility than we have in the A–7E by quantums, not just smaller airplanes, but by quantums."

Mr. Chairman, I do not believe you can find an aeronautical engineer who would testify that the F–18 represents an improvement over the A–7E by quantums, not quantum, but quantums. Yet, this is the aircraft Navy plans as a replacement for the A–7.

As I indicated earlier, I have serious reservations that the A–18 can be as effective as necessary for attack missions during the 1990s and beyond. I think an aircraft more specialized for the attack mission will be required. While the Navy's current attack force of A–7Es is going to require eventual replacement, I do not think it makes sense to replace the A–7E with an aircraft that does not

offer the degree of improved performance necessary. The decision for Navy to proceed with a new aircraft should not be made on what we have seen thus far. Certainly the A–18 does not fill the requirement.

Personally, Mr. Chairman, I do not see any requirement at the moment to concern ourselves with a replacement for the A–7. Contrary to what Navy has implied in testimony, the A–7 can be improved to the point it could handle the attack mission into the early 90's. For example, the A–7E can be equipped with a 23,000-lb. thrust engine with afterburning, FLIR (forward looking infra-red), LGB (laser guided bomb), and HARM (high-speed anti-radiation missile). The new engine will enable the A–7 to sustain 5.43Gs at .85 Mach and increase its attack speed from 505 knots to 600 knots. The approach speed of the improved A–7 will be reduced to 128 knots from the current 139 knots. The estimated program unit price is about $6.5 million for 400 aircraft in FY 1975 dollars whereas the estimated program unit cost for 400 A–18 aircraft is $13.3 million in FY 1975 dollars.

These performance figures would, of course, be subject to verification but, to date, Navy has not seen fit to make an analysis of improving its A–E7 fleet versus procuring 400 A–18s. I urge the Committee direct the Navy to conduct this analysis prior to making any further decisions on this program. Until that analysis is made, it is obvious that Navy has not fully examined other alternatives that might prove more effective.

Thank you.

GENERAL ACCOUNTING OFFICE

STATEMENT OF PAUL G. DEMBLING, GENERAL COUNSEL, GENERAL ACCOUNTING OFFICE

ACCOMPANIED BY:
PAUL SHNITZER, ASSOCIATE GENERAL COUNSEL, GAO
JEROME STOLAROW, DEPUTY DIRECTOR, PROCUREMENT AND ACQUISITIONS SYSTEMS DIVISION

INTRODUCTION OF ASSOCIATES

Chairman McCLELLAN. The next witness is Hon. Paul Dembling, General Counsel of the General Accounting Office.

Will you come to the hearing table, please.

You may introduce your associates for the record.

Mr. DEMBLING. Thank you very much, Mr. Chairman.

On my left is Mr. Paul Shnitzer, Associate General Counsel of the GAO, and on my right is Mr. Jerome Stolarow, Deputy Director of the Procurement and Acquisitions Systems Division.

Chairman McCLELLAN. Very well, you may proceed.

DECISION ON LTV AEROSPACE CORP., B–183851

Mr. DEMBLING. I have a short statement, Mr. Chairman. We have been requested to summarize our decision in the matter of LTV Aerospace Corp., B–183851, dated October 1, 1975. This statement is in response to that request and concerns the role of the General Accounting Office in reviewing the Navy's selection of the F–18 as its air combat fighter.

As a major part of this role, we recently considered the protest of the LTV Aerospace Corp. against the Navy's selection of the McDonnell Douglas Corp. to develop the F–18. The essence of LTV's complaint was that the selection of the design proposed by McDonnell Douglas was contrary to law and to public policy, and that LTV had not been treated fairly in the source selection process.

LTV's protest was handled in accordance with our bid protest procedures, pursuant to which we consider protest against the award or proposed award of Government contracts. Our determinations under these procedures are limited to the legality of the Government's intended or actual course of action, measured in light of the statutes and implementing regulations pertaining to Government contracting. They therefore do not involve consideration of such things as program effectiveness and policy decisions, which we do consider separately in our audit reviews.

In accordance with our bid protest procedures, we requested and received a fully documented report from the Department of the Navy. In addition, we conducted an investigation in order to obtain data with respect to the technical and cost issues raised by the protest. Our decision was based on submissions from the Navy, LTV, and McDonnell Douglas, and on information obtained through our independent audit review.

GAO STUDY NOT A COMPREHENSIVE REVIEW OF AIR COMBAT FIGHTER PROGRAM

Since this matter was considered in the context of a bid protest and was therefore narrowly focused, we did not engage in a major, comprehensive review of the Navy's air combat fighter program. Rather, we considered whether the Navy's award of short-term sustaining engineering contracts as a result of its selection decision was illegal or contrary to public policy, as claimed by LTV, and whether the Navy's conduct of the competition was unfair or otherwise improper.

Our review of the competitive aspects of the procurement covered certain technical matters, particularly with respect to the proposed engines. It also included a review of the Navy's cost evaluation of the competing proposals. However, as was stated in the decision, we did not consider nor deal with the overall efficacy of the Navy's decision either in terms of program effectiveness or lowest possible cost.

LEGALITY OF F–18 SELECTION

We initially considered whether the selection of the F–18 was illegal since the Air Force had selected the F–16 and the conference report accompanying the 1975 fiscal year DOD Appropriation Act provided that "adaptation of the selected Air Force air combat fighter . . . is the prerequisite for use of the funds provided."

We recognized that such language reflected the congressional desire that the Navy select a fighter aircraft design derived from the design selected by the Air Force for its air combat fighter. We further recognized that as a practical matter the Navy had to deal with that language. However, we concluded that since the law itself was clear and did not include similar restrictive language, the Congress had not imposed such a restriction of the Navy as a matter of law. This conclusion was consistent with the position the General Accounting Office has taken over the years, both in decisions of the Comptroller General and in reports and other correspondence to Members of Congress.

CONTRACT AWARDS IN CONTEXT OF PUBLIC POLICY

With regard to the claim that the contract awards were contrary to public policy, our review indicated that the courts have held contracts to be void as against public policy if they call for a result which is contrary to law or if they result from illegal behavior. Since the contracts awarded by the Navy did not come within either category and since there is a strong presumption in the law in favor of the validity of contracts, we found no basis for concluding that the awards should be regarded as invalid on public policy grounds.

Our legal review also encompassed questions concerning reprograming under which executive agencies in conjunction with the Con-

gress may shift funds from one program to another within a particular appropriation account. The Navy believed that its proposed use of funds for the Navy air combat fighter was communicated to and approved by the cognizant congressional committees, and that it therefore complied with the spirit and content, if not the literal requirements, of DOD's reprograming directives. These directives deal with internal procedures and do not purport to affect rights under contracts. Therefore, any failure on the part of the Navy to comply with them literally did not bear on the legality of the Navy's expenditure.

In our decision, we noted that section 843 of the 1975 DOD Appropriation Act precluded the use of funds being appropriated by that act for the presentation of a reprograming request to Congress. However, we held that this provision could not be used as the basis for attacking an otherwise legal contract award.

FAIRNESS OF COMPETITION

In determining the overall fairness of the competition, we consider LTV's claim that the basic Navy solicitation required the NACF designs to be derivatives of the F–16, the selected Air Force air combat fighter design.

Our examination of the procurement documents indicated that the Navy was seeking the best performing aircraft design available, which ideally, but not necessarily, would be a design based on the F–16. We found that the language of the solicitation was directed toward utilization of the hardware and technology developed by DOD in its lightweight fighter and air combat aircraft programs, and not the hardware and technology associated only with the F–16 design.

We noted that while the Navy desired maximum commonality with the previously developed technology and hardware, the solicitation documents encouraged offerors to make tradeoffs in order to meet cost and performance requirements. We also noted that LTV's proposals reflected an awareness that offerors were not restricted to achieving commonality only with the F–16 design, and that in fact one of LTV's proposed designs differed substantially from the F–16 design.

Accordingly, it was our view that the offerors were on notice that the Navy competition was not to be based on a Navy derivative of the F–16 design, and that LTV therefore could not have been prejudiced or otherwise treated unfairly by the Navy's consideration and ultimate selection of a design not based on the F–16.

ACCEPTABILITY F404 ENGINE

We also found that the F404 engine proposed by McDonnell Douglas was authorized for use with the F–18. This is basically the J101 engine, which was listed in the solicitation as acceptable, with certain modifications.

Finally, in the cost area, we did not consider whether the F–18 represented the least costly acceptable alternative that would satisfy the Navy's needs. Rather, we reviewed the Navy's cost evaluation of the competing proposals to see if the evaluation was fair and in accordance with both proper procedures and the established evaluation criteria. We found that it was. We did point out that while the F–18

design will cost more than designs based on the F–16 derivative designs, cost in the evaluation was an important but not controlling factor, and that the Navy considered this cost difference to be completely offset by the superiority of the McDonnell Douglas design.

GAO DECISION

In summary, we determined that the Navy's actions in awarding the sustaining engineering contract were neither illegal nor improper. We did recognize that Congress has been closely monitoring the Navy's efforts to develop a low-cost fighter, and that the project would be further scrutinized before full-scale development funds are provided. Presently, we are examining various aspects of the Navy's source selection decision, from an audit standpoint, both in response to specific requests from Members of Congress and as a part of our annual review of major weapon systems. This ongoing work includes a comparison of the development, procurement, and life cycle costs for Navy derivatives of both the F–16 and F–17 aircraft.

This concludes my prepared statement. We would be pleased to respond to any questions the subcommittee may have.

In this connection, I might also request if I may respectfully, to have the entire decision printed in the record.

Chairman McClellan. We have provided that a summary of it be included in the record, with the entire decision remaining on file for reference.

I want to get a better understanding of these interpretations. Early in your statement you said, "we initially considered whether the selection of the F–18 was illegal since the Air Force had selected the F–16 and the conference report accompanying the 1975 fiscal year DOD Appropriations Act provided that "adaptation of the selected Air Force air combat fighter is the prerequisite for use of the funds provided."

CONFERENCE REPORT LANGUAGE NOT LEGALLY BINDING

Now, if that was not a determinate factor in your decision, what impact does it have as a matter of law? What potency does that statement have in the report of the Congress?

Mr. Dembling. Well, I guess we were dealing with it from the standpoint of a legal determination—what the Congress meant. It is a persuasive argument as to what the Congress intended when there is ambiguity in the law itself.

Whenever the Congress has wanted to place restrictive language into statutes, it has done so. In fact, in this specific 1975 appropriation act there was restrictive language on other portions of the program, so that the feeling has been all along in interpretation of reports of this type that unless the Congress actually places it in the statute it is persuasive argument. It indicates the feeling of the Congress, and it is instructive to the agencies that have to deal with the committee.

Chairman McClellan. But it is not binding on the agency?

Mr. Dembling. It is not binding on the agency.

Chairman McClellan. Well, we are learning something. I don't know what purpose it serves then, to write the intent of the conferees into the report language.

Mr. DEMBLING. This has been the standard thing.

Chairman MCCLELLAN. I say I am learning.

Mr. DEMBLING. There have been court decisions and GAO decisions.

Chairman MCCLELLAN. So this language had no probative force so far as your determining the legality of it. We might just as well have not written it.

Mr. DEMBLING. Insofar as determining whether the Navy could or could not go forward with it from a legal standpoint, that is correct.

Chairman MCCLELLAN. In other words, it did not compel the Department to comply?

Mr. DEMBLING. That is correct.

Chairman MCCLELLAN. This presents something the committee is going to have to consider very carefully.

MORAL OBLIGATION INCURRED BY REPORT LANGUAGE

Senator PASTORE. It amounts to the same thing as the sense of the Congress. Congress can express its sense, but the administration doesn't have to follow it as a legal responsibility; that is what you are saying. But there certainly is a moral responsibility to abide by it?

Mr. DEMBLING. Yes. And I think that we pointed that out in the decision, that the Navy has to make its peace with the Congress, but no law was violated.

Senator PASTORE. It was an affront to the intention of the Congress.

Chairman MCCLELLAN. I would like to know what the probative force of this language is in a conference report and what probative force is given to it by the General Accounting Office.

Mr. DEMBLING. In terms of this, we feel the conference report or any report which indicates what the Congress—what the committee had in mind at the time that it passed on the legislation is helpful. If there is an ambiguity in the law and you have to go back to the conference to see what did the committee intend by that language, then I think that it is useful.

Chairman MCCLELLAN. What do you think the committee intended by this language?

RESTRICTIVE LANGUAGE IN THE LAW

Mr. DEMBLING. I think the committee intended to instruct the Navy as to how it ought to carry out its program. However, the committee did insert restrictive language in the statute in other areas, and for example, title III of the act provided that not less than $355 million of the Army's operation and maintenance appropriation shall be available for the maintenance of real property facilities. There is a restriction right in the act. Similar restrictions were placed on the Navy, Air Force, and other DOD elements.

However, when it came to this aspect, it could very easily have been placed in the act, and had it been placed in the act, it would certainly have been a restriction, and then it would have been an illegal act for the Navy to have done what it did.

Chairman MCCLELLAN. As the language was included in the conference report, it was not legally binding for the Department?

Mr. DEMBLING. That is correct.

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Chairman McCLELLAN. And from the standpoint of the General Accounting Office in evaluating and rendering a decision on the legality, if we mean to place a restriction, then it must be done in the act and not in a recommendation in a report by the Conferees.

Mr. DEMBLING. That is right. I can draw an analogy from lump sum appropriations.

Chairman McCLELLAN. I want that fact established. My next question is, your decision did not deal with the moral obligation that the Navy may have had. You simply dealt with the legality of it?

Mr. DEMBLING. We dealt with the legality of it. We did make reference to the fact that the Navy probably couldn't ignore the language, only that failure to comply did not make the contract illegal.

GAO DECISION BASED ON LEGAL RATHER THAN MORAL BASIS

Chairman McCLELLAN. You are not sustaining their action from a moral standpoint; but on a strictly legal basis, you say they did have the right?

Mr. DEMBLING. Yes.

Chairman McCLELLAN. Are there any questions?

Senator YOUNG. Did you find any contradiction in the language in the conference report than in any provisions of the bill itself?

Mr. DEMBLING. I don't think we did. These were lump sum appropriations which we didn't find any restrictive language in the act itself that provided or carried out the provision that was stated in the conference report.

Senator YOUNG. This brings up a new precedent so far as I know about. Usually when there is no contradiction between the language in the report of the conferees and the bill itself, you would think, however, whoever it affected would abide by the conference report.

Chairman McCLELLAN. You say there was no conflict between the report language and the law itself?

Mr. DEMBLING. It was not mentioned.

Chairman McCLELLAN. Did you find any conflict between this statement in the conferees' report and the Appropriations Act itself?

Mr. DEMBLING. No; we did not.

Senator PASTORE. There was a contradiction between writing it in the report and specifying it as a restriction by statutory law, and within the same document that was presented to the Defense Department, here we had in the law its certain limitations, and yet the Congress did not think it important enough to write that limitation in the law. It wrote it in the report.

I have been here for 25 years, and I have attended God knows how many conferences, and any time you want to avoid something, you say, "Write it in the report, when you want to avoid responsibility."

If Congress wants a limitation, then they ought to write it in the law, and that is all you are deciding. The fact that we did not write it in the language, there was no legal violation.

Mr. DEMBLING. Yes.

Senator YOUNG. There is some difference between the language in the conference report and in the Senate or House bills.

Senator PASTORE. In other cases, we had gone out of our way to write it in the bill. In this particular case, we didn't do that, and they

reached the conclusion that since we did not put it in the law, there was no violation.

Senator YOUNG. I agree on the legality.

Senator PASTORE. That is all he decided.

FUTURE IMPLICATIONS

Chairman MCCLELLAN. What I'm wondering now, is that if every time we wish to give guidance to the Department, we have to write it into rigid law. Is that the way we have to deal with the Defense Department?

Mr. DEMBLING. If you want to make it a matter of legal commitment and require the agency to comply with what the Congress desires from a legal standpoint, it has to be, or should be, in the law. However, when you bring up the moral commitment or dealing with the Congress, it seems to me that an agency pays a lot of attention to what is in the conference report, or a report of the committee.

Chairman MCCLELLAN. Sometime it does, but in this instance it didn't.

Mr. DEMBLING. Usually I think it pays attention because it must make its peace with the committee and still has to appear before the committee, and still must get its appropriation from the committee.

Chairman MCCLELLAN. Isn't that just your hope or expectation of what they would do?

Senator PASTORE. I understand in these presentations the Navy Department did take it up with the congressional leaders.

Chairman MCCLELLAN. I am trying to make a determination for the future, that if Congress really wants its wishes obeyed, they must be written into law.

Mr. DEMBLING. That is right.

Chairman MCCLELLAN. We cannot hope to accomplish it by expressing our viewpoint in persuasive language in a report, because that can be ignored.

Senator INOUYE. If they ignore it, we follow it up by punishment, isn't that what it is?

Mr. DEMBLING. Yes, sir.

COMPARABILITY TO "SENSE OF THE SENATE" RESOLUTIONS

Senator HRUSKA. Is there some comparability to the situation embraced in a sense of the Congress resolution or a sense of the Senate resolution? There it is universally agreed that it has no force of law, and it is simply the sense of the Congress thus and so. The presumption is that if the Congress really wanted to put binding and legal effect into that situation, they would not have such a resolution but they would have had a legislative act.

Now, that is a much stronger case than here, where it is not even said in our conference report, it is the sense of the conference. It is the sense of the two bodies because they approved the conference report, but if the express resolution saying it is the sense results in no legal binding effect, certainly in this lesser situation there could not be.

I am interested in the statement that you make here, that this conclusion was consistent with the position that the GAO has taken

over the years, both in decisions of the Comptroller General and in reports and other correspondence to Members of the Congress. This is not peculiar to the Defense Department, is it?

Mr. DEMBLING. No.

Senator HRUSKA. It is a universal application wherever we have a similar language situation.

Mr. DEMBLING. That is right, and in the full decisions we cite those examples, so that one can understand what we are getting at.

Senator HRUSKA. I agree with the chairman, that both Houses of Congress should take precaution when they are serious enough to make a legal binding situation. If they want to duck an issue, and say, "Well, let us avoid an abrasive confrontation," they can probably try this kind of language, and we have the effects thereof visited upon us in this instance.

Senator YOUNG. I think we have been wasting a lot of time writing conference reports.

SUBCOMMITTEE RECESS

Chairman MCCLELLAN. Are there any other questions?

We will recess and come back at 2 o'clock.

(Whereupon, at 12:25 p.m., the subcommittee was recessed, to reconvene at 2 p.m., the same day.)

(AFTERNOON SESSION, 2 O'CLOCK, TUESDAY, OCTOBER 21, 1975)

F–18 NAVY AIR COMBAT FIGHTER

NONDEPARTMENTAL WITNESSES

STATEMENT OF GEORGE A. SPANGENBERG, McLEAN, VA.

OPPOSITION TO F–18 DEVELOPMENT

Chairman MCCLELLAN. I understand that one of my colleagues has been delayed, but we had best proceed.

Our first witness is Mr. George Spangenberg.

Mr. Spangenberg, we welcome you to the committee, and I note you have a prepared statement. Do you wish to read it?

Mr. SPANGENBERG. I do.

Chairman MCCLELLAN. You may proceed.

Mr. SPANGENBERG. Mr. Chairman, in this, my first appearance before your committee after a career dedicated to naval aviation, I find myself in the uncomfortable position of being opposed to a program which is, on the record at least, being supported by my former colleagues within the Navy. It is my hope that I can help you understand how such differences can exist and also explain in relatively simple terms why I believe it would be a mistake to develop the F–18 as it is now defined.

BACKGROUND

I am presenting my conclusions on the F–18 from a background of 40 years involvement with naval aviation and an intimate knowledge of every new naval aircraft started in the last 35 years. I was directly involved in the initiation, justification, and source selection of every aircraft design now in naval service, and believe I know as well as anyone the problems encountered in the acquisition process. I do not claim to know the solutions to all those problems, but I certainly can recognize the nonsolutions proposed by many of those speculative theorists who have no actual experience in the field.

I believe strongly that each new program must be justified on the bases of both cost and effectiveness, as they have been in the past 20 years or so. A low cost program which fails the effectiveness test is obviously no bargain, and no justification exists for a new program such as the proposed F–18 which flunks the effectiveness test and costs more than other fully defined alternatives which already exist.

The chairman will remember my connection with the TFX and his investigation of that ill-conceived and obviously mismanaged project. One of the lessons I learned from that program was that poor decisions could be made by senior officials in OSD even when they were provided with proper facts.

SUPPORT DEMANDED FOR OSD POSITION

It was also apparent that facts at variance with an OSD established position often failed to reach the decisionmaker in recognizable form after progressing up the chain of command from the engineering level within the service. I also learned that it is virtually impossible for Congress to obtain a frank opinion from subordinate officers within a service or any data from service spokesmen which does not support an OSD position. In too many cases support is directed from the top under threats which to me appear to be almost blackmail.

As I recall, all Navy spokesmen, military and civilian, supported the F–111B in authorization and appropriation hearings for several years, despite clear evidence available to them that a successful conclusion was not feasible. The Congress finally had to direct termination of that program allowing the Navy to escape condemnation for insubordination.

Often in the hearing procedure the OSD spokesman in his initial remarks will emphasize that he has the full support of the service involved, effectively stifling any show of dissent. Within the service, the normal rationale used for justifying these second-rate programs which have been directed from above is that "Anything is better than nothing."

This attitude has been apparent within the Navy for the last few years since the completely arbitrary decision by OSD to limit F–14 procurement to about half that which had been justified previously on cost and effectiveness grounds to both OSD and the Congress. With the acceptance of the OSD decision, however, every effort was expended in finding reasonable alternatives while hoping that eventually logic would prevail to reverse the decision before production of the preferred models ceased. Overall, the situation is bad and appears to be worsening as OSD assumes more and more of the authority in the weapons system acquisition process.

SEARCH FOR LOW COST ALTERNATIVE TO F–14

The OSD has had what appears to be an obsession with the search for a lower cost alternative to the F–14 and its weapon system, ever since contractual problems were experienced with Grumman in 1971. Two years ago an OSD plan which originally involved prototyping of an F–15N, a modernized F–4, and a reduced capability F–14 was wisely rejected by the Congress when it became apparent that the final outcome would have been a loss in effectiveness and an increase in costs.

Last year after no acceptable pure fighter alternative had been found which was cheaper than the F–14, a multipurpose fighter attack concept was suggested which would serve as both an F–4 and A–7 replacement. Congress and the OSD then combined to kill any hope that this VFAX concept could provide an adequate replacement for these types by directing that the design should be a derivative of the Air Force's lightweight fighter. This direction not only limited the competition, but it tended to constrain many of the requirements which were ultimately specified to something less than the levels which the F–4 and A–7 inventory currently possess.

After permitting both of the competing contractors considerable and necessary leeway in deviating from the original Air Force design, the Navy selected the McDonnell Northrop design as the best of those under consideration, designated it the F–18, and is preparing to proceed with its development.

FAIR SELECTION PROCESS

Although the losing contractor in the competition protested the award, there is no doubt in my mind but that the selection process itself was fair and equitable to that contractor and that indeed the best design was chosen. The source selection decision should not be an issue, although one can certainly question the fairness of the entire procurement process when Air Force technology prototypes were allowed to grow into large-scale development and production programs without permitting all of the industry to compete. One can also question the adequacy of the analysis and justification, if any, which started the entire exercise.

With some of the background out of the way, let me give you my evaluation of the F–18 program, using data presented by the Navy in previous hearings, or published in trade journals, as my basic source of technical and cost information. I will try to simplify the situation to the essential ingredients of whether the F–18 is worth buying as either a fighter or as an attack aircraft on the grounds of cost and effectiveness.

EVALUATION OF F–18 AS A FIGHTER PLANE

Starting with the fighter case, we find by interpolating the Navy program cost and delivery data given in your earlier "Lightweight Fighter Hearings," that the first 400 aircraft will be delivered as fighters between the years 1981 and 1986 at a total program acquisition price of $5.3 billion in constant fiscal year 1975 dollars. This means an average price of over $13 million, certainly more than the average cost of an additional 400 F–14's over the programed 330.

If one were to extrapolate from the fiscal year 1975 budget price of an F–14, using the same quantity/price relationship used for the F–18, the average cost of 400 additional F–14's would be under $11 million. Since no one has disputed the fact that the F–14 has a great advantage in capability, a normal evaluation would end at this point with the showing of greater effectiveness at a lower acquisition cost for the F–14. However, unlike the situation in most competitions, operating costs differ between the two designs with Navy figures giving an advantage of $0.5 million per year per operating aircraft to the F–18.

If one assumed 18 squadrons of 12 airplanes each, operating cost savings would presumably be 18 times 12 times $0.5 million or $108 million per year, thus allowing the acquisition deficit for 400 aircraft to be offset after about 8 years of operations. In simple terms, then, we start delivering the new fighters in 6 years, finish in 11, and break even in total cost about the end of the next decade.

Now for the effectiveness part of the equation. Although there has been little public discussion of absolute effectiveness levels of our various fighters, some understanding of relative values can be gleaned from justifications used by the services in starting new programs and then continuing them.

IMPORTANCE OF WEAPON SYSTEM TO A FIGHTER

As is well known, the capability of a fighter in today's world is primarily a function of its weapons system and its missiles rather than pure airplane performance and maneuverability, although these, of course, cannot be completely ignored.

Two years ago the Navy testified that the F–14 with its multishot system and Phoenix missiles was equivalent to at least three F–4 aircraft with its single-shot system carrying Sparrow missiles against a moderate performance bomber raid.

The Congress has also received testimony that against some of the more difficult targets the F–14 and Phoenix combination is infinitely better than the F–4 with its Sparrows since the latter has no chance of killing that type of threat.

To understand the importance of the weapons system and missiles to an aircraft, you should also know that operational analysts rate an F–14 with Phoenix as twice as good as an F–14 with Sparrow against most targets in most threat situations.

CREW SIZE

Two years ago Congress heard from the Navy that a two-man crew was necessary in its all-weather fighters in order to minimize cost effectiveness. At that time OSD expressed its concurrence on the issue of crew size. You also know that more radar range gives greater effectiveness. Keeping these facts in mind, it is clear that the ranking of Navy fighters in overall combat effectiveness would be the F–14/Phoenix first by a wide margin, the F–14/Sparrow next, followed by the F–4 and then the F–18. The latter suffers from its one-man crew, less powerful radar, and fewer missiles, which combine to offset its predicted better reliability and maintainability characteristics, and its better turning performance. Overall, the F–18 type of fighter would fail a normal cost effectiveness justification over the F–4, a design initiated about 20 years ago.

F–18 CAPABILITY

In judging the capability of the F–18 relative to foreign threats, one should bear in mind the timing of the program. The 6-year period before production deliveries start corresponds to the time spent in developing, producing, and deploying the F–14. It is obvious that any enemy has ample time to produce a counterattack. The enemy's task is enormously simplified if he has to counter only designs such as the F–16 or F–18. If he chooses, he can easily design a better dogfighter, since he has lesser constraints, and can thus defeat the F–18 in the only area in which anyone now claims a superiority over the F–14. To win in an air-to-air war, we must invest in better weapons systems and missiles if we are to have a chance of winning.

Summing up the fighter case, the F–18 has no more capability than an F–4 and costs more; while it has far less capability than an F–14 which costs no more, and is available years earlier. There is no way in which the F–18 can be justified as a Navy fighter.

F–18 AS A–7 REPLACEMENT

Having shown that buying the first 400 F–18's as fighters makes no sense, let's now consider the second 400 aircraft which have been proposed as A–7 replacements. Costs in this case favor the A–7 both in quoted acquisition prices and in operating costs. Again using the Navy data for the total F–18 program, we find the unit procurement price for the F–18 attack models to be a little over $6M while the A–7 equivalent price has been quoted at less than $4.5M. Comparable operating prices were quoted by the Navy as $0.9M for the F–18 and $0.75M for the A–7.

Overall, one sees that the F–18 is about half again as expensive as the A–7, to to be justifiable it should have at least that degree of superiority. It has been stated that the F–18 using three drop tanks has a slightly lower operating radius than the A–7 using two tanks, that the weapon systems are closely comparable, but that the F–18's higher combat speed reduces its vulnerability, making it a better overall attack airplane.

Unfortunately, the difference in payload per radius characteristics of the two models is greater than implied by such testimony, particularly if the pilot actually uses his maximum power to achieve the claimed advantage in combat performance. Approximations of the differences in operating radii with the same bomb load and with the same number of external tanks show that the A–7 outranges the F–18 by about 150 miles when the pilot of the latter does not use his potential speed advantage and by about 250 miles when he does. The F–18 does not approach the 600-mile radius on internal fuel with six 250 pound bombs, which was one of the requirements in the original A–7 competition in 1973, nor does it match the 750-mile strike radius with external fuel estimated for the F–4 early in its development. To the uninitiated, the attack radius quoted for the F–18 sounds not unreasonable, until one realizes that maximum external fuel is used on the least demanding for the many attack radius problems which exist. Its true range characteristics can better be gauged by noting that it is inferior on internal fuel and without combat power usage to what was initially estimated for the A–4 in 1952. To continue this line of logic, it will be recalled that the A–7 was justified some 10 years later in part by the fact that its capability was twice that of the A–4, and that that level of capability was needed. Although there are other deficiencies in the design as it has been reported, its range performance alone is sufficient to disqualify it for serious consideration as an A–7 replacement. With a 50-percent higher price and a 50-percent lower capability than the A–7, the F–18 cannot be justified as an attack airplane.

F–18 AS A RECONNAISSANCE PLANE

In previous hearings the potential use of the F–18 as a reconnaissance type has also been claimed. Its range deficiency would appear to rule out its use in this role, which normally requires greater range than for the fighter and attack models for which it is doing the reconnaissance.

Somewhat as an aside, I might state that it is probable that the logic used for the F–14/F–18 choice would carry over to the F–15/F–16 issue, although with no cutback yet required of planned F–15 procurement to accommodate the F–16, the problem is less critical to the Air Force.

In your earlier hearings, the Air Force showed equal cost forces to be 650 F–16's or 520 F–15's, including a 5-year operating period. If the F–15 is worth buying at all, its capabilities must easily offset the small numerical advantage noted.

F–18 NOT COST-EFFECTIVE IN EITHER ROLE

Summarizing, it is clear that the F–18 is neither effective, nor cost effective, in either fighter or attack roles. It is vastly inferior in capability to the F–14 at about the same total cost, somewhat less capable and considerably more expensive than the F–4 and is inadequate in range and more costly than the A–7. The F–18 would have failed to survive any of the cost effectiveness studies conducted by the Navy in seeking F–4 and A–4 replacements in the last 15 years. There is no justification for continuing the program.

Funds now planned for the F–18 should be redirected to first increase and then hold F–14 production at a reasonably efficient level, thus solving the Navy fighter gap problem. Study work and component development should also be started on an adequate replacement for the A–7 when that becomes necessary. The Navy's goal of reducing carrier types is achievable with a mix of F–14's and A–7's far easier, at less cost, and with a greater level of capability than with a mix of F–14's and F–18's.

RATIONALE OF HIGH-LOW MIX CONCEPT

The question has been raised as to how the lightweight fighter program managed to obtain so much support in view of the cost and effectiveness arguments against it. In large measure, it seems to me that the basic problem lies with those who propose simplistic solutions to very difficult problems. In this case the OSD proposed high-low mix concept was the culprit. It was assumed, without proof, first that we could not afford all the first-line weapons we needed and then assumed, again without proof, that buying a mix of first-line and second-line weapons would cost less than all first line. A primary goal in the lightweight fighter program seems to be to "prove" this concept, by forcing a mix of F–15/F–16 on the Air Force, and F–14/F–18 on the Navy. Actually, the virtue of a mix of equipment has long been known and practiced in both military and industrial circles but only when it made sense to do so. In the case of an aircraft carrier, for example, a mix of high price and high capability F–14's with the lower priced A–7's could be considered a realistic implementation of the high/low mix theory. It is clear that each case needs to be examined on its own merits, with cost and effectiveness both considered.

There has been much talk by OSD of solving the problem of our numerical inferiority to the threat by the lightweight fighter program

and the high-low mix concept, but the figures to date belie the rhetoric. It seems clear to me that OSD should reexamine its policies and adopt only those which give us some chance of winning.

That completes my prepared statement. I will be glad to answer any questions.

Chairman McClellan. Thank you very much, Mr. Spangenberg. I take it you think there is very little in the F–18 as a weapon?

F–18 OUTMODED WEAPON

Mr. Spangenberg. That is right, sir.

Actually, Senator, it is a good airplane in its field, but the field was passed by 15 years ago. It is that kind of airplane. If we were starting an airplane in 1952, I think we could make a case for the F–18.

Chairman McClellan. Are you saying the proposed F–18 is not a plane with the advanced qualities needed in the 1980's, that it fits back into another period?

Mr. Spangenberg. Yes, sir.

Chairman McClellan. In your opinion, it will be inadequate in the future?

Mr. Spangenberg. Yes, sir.

Chairman McClellan. Earlier in your statement you said, "A low-cost program which fails the effectiveness test is obviously no bargain." How does the F–18 fail the effectiveness test?

Mr. Spangenberg. In order to be worth buying, the airplane should be capable of defeating the threat as it has been defined.

F–18 CANNOT DEFEAT PROJECTED THREAT IN 1980's

Since the late 1950's, it has been the position of the Navy that the equivalent capability to that which we finally have in service today as the F–14 is the level of capability that is needed. As I see this situation, the F–18, overall, would be somewhat less effective than our F–4 inventory, at least as analyzed by naval operational analysts.

The program to replace F–4's actually started with the Eagle/missileer program in the late 1950's; then we were forced into the TFX program, again justifying that approach over what was then the F–4 and against the known threat. We again went through the justification process in the late 1960's when we changed from a TFX, and its VFAX complement, to the program which became the F–14.

I don't think that the F–18 will handle the kind of threat we are liable to see in the next decade.

Chairman McClellan. Would you say that the expertise in the Defense Department, and in the Navy Department, should be able to recognize this fact?

Mr. Spangenberg. It certainly should.

Chairman McClellan. You spoke of the TFX–111B which is supposed to be a Navy plane?

Mr. Spangenberg. Right.

Chairman McClellan. Has the Navy ever secured a substitute for the F–111B?

Mr. Spangenberg. The F–14 is really the substitute for that aircraft.

Chairman McClellan. The F–14 was a plane that the Navy procured instead of the F–111B?

Mr. Spangenberg. Right.

SITUATION SIMILAR TO TFX CONSIDERATION

Chairman McClellan. We both know some of the reasons that program failed. You referred to some things today that I think were revealed in consideration of the TFX: similarly:

> I also learned that it is virtually impossible for Congress to obtain a frank opinion from subordinate officers within a service or any data from service spokesmen which does not support an OSD position.

I think that was absolutely and literally true in connection with the TFX program. Are you saying that situation has now carried over into the present?

Mr. Spangenberg. Yes, sir.

Chairman McClellan. When did you leave the Navy?

Mr. Spangenberg. 1973.

Chairman McClellan. Just 2 years ago.

Are you contending that this situation exists today with reference to the F–18, that subordinate officials in the Department are not permitted to state their honest opinions to congressional committees with respect to the merits of this and other programs?

Mr. Spangenberg. I think that is my feeling, yes. I have talked to too many people at the lower working levels who feel exactly as I do on their program.

Chairman McClellan. You further state, "In too many cases, support is directed from the top under threats which to me appear to be almost blackmail."

Have you had that experience in the Navy?

Mr. Spangenberg. I have been in meetings, from the TFX days on, in which that type of threat appeared. The type of thing, "You take this or you get nothing."

"If you don't take this, we will cut back the carrier program, or we will cut back the shipbuilding program."

Chairman McClellan. Do you regard that as a form of coercion?

Mr. Spangenberg. Certainly.

STIFLING OF DISSENT

Chairman McClellan. You go on to say, "Often, in the hearing procedure, the OSD spokesman in his initial remarks will emphasize that he has the full support of the service involved, effectively stifling any show of dissent."

Do you have any reason to believe that situation prevails now in connection with the F–18?

Mr. Spangenberg. I really believe it does, yes, sir.

Chairman McClellan. You mentioned a moment ago that subordinates are placed in a position where they have to realize that anything is better than nothing.

You further stated, "This attitude has been apparent within the Navy for the last few years, since the completely arbitrary decision by OSD to limit F–14 procurement to about half of that which had been justified previously on cost effectiveness grounds to both OSD and the Congress."

Why do you have such apparent partiality toward the F–14? Do you have any connection in any way with the producer of the F–14?

Mr. SPANGENBERG. No, sir. I have talked to the producer of the F–14. I have been, obviously, friends with many of the people in Grumman and in McDonnell Douglas, and in Sikorsky, and all through the industry. I have never been connected in any way financially with Grumman.

Chairman MCCLELLAN. Let's carry this just a little further.

FINAL RESPONSIBILITY OF DECISION-MAKING

Do we not recognize that in the Defense Department, as in any agency or functioning of the Government, there has to be some place where the decision is made, where the responsibility finally rests. I think you must agree that there must be some measure of discipline—not the stifling of opinions, but someplace where the final decision has to be made. Is that not really the process that goes on in making these decisions?

Mr. SPANGENBERG. Yes, sir. I think I am really questioning though whether or not the military has sufficient voice before the decision is made, and I am worried that many of the decisions are being made by people that I consider rank amateurs in the total weapon acquisition process.

I don't believe that the military, in fact, get the fair shake in the whole budget process. The Congress never hears the position which is generated within the Navy, so they have no recourse really. The only recourse comes in the way of leaking data to a staff of the congressional committee so you can ask questions and try to break out the true facts.

Chairman MCCLELLAN. Well, if I understand what you are saying, once the decision is made at the final level of authority, then absolute loyalty and acquiescence is exacted from all subordinates. Is that what you are saying?

Mr. SPANGENBERG. Yes.

Chairman MCCLELLAN. It's the type of situation where neither extreme is desirable. If people cannot feel free to come before Congress and express their honest opinion, how can we hope to evaluate a program? On the other hand, if the Department can command no loyalty—and there are opponents to every program—we would have nothing but chaos. It is difficult to arrive at the middle ground.

You have been down there a long time, and you just left there recently, 2 years ago?

POWER IN THE ACQUISITION PROCESS

Mr. SPANGENBERG. Yes, sir. The power in the acquisition process is going more and more to the top of OSD, and the job of the guy at the top of OSD is just too broad for him to get into the details of all of the programs that are going on.

I had trouble enough doing my part of the job, but I think that I was in a far better position to make a competitive decision on who should be selected from a weapons system than the Secretary of Defense, who had never seen a proposal, and knew only that about the program which was told him. If he did not concur with me basically it was because I had done a lousy job in making a presentation to him rather than he had superior knowledge on a particular program.

Chairman McClellan. Another section of your statement reads, "The source selection decision should not be an issue, although one can certainly question the fairness of the entire procurement process when Air Force technology prototypes were allowed to grow into large-scale development and production programs without permitting all of the industry to compete."

You further stated, "One can also question the adequacy of the analysis and justification, if any, which started the entire exercise."

What do you mean by that? Amplify it for us.

EVOLUTION OF LIGHTWEIGHT FIGHTER PROGRAM

Mr. Spangenberg. Well, this starts back in the history of how the lightweight fighter program got started. It was really by direction of OSD. A decision was made that there were inadequate funds going to be made available so we had to reduce the cost of programs. The assumption was made that this high/low mix would solve, in part, the problem. That by prototyping we would get more alternatives and have more options for the future and that by having prototypes we would reduce the costs of production.

One can question almost every assumption made in that list. When the decision was finally made to go ahead with prototype programs, the Air Force assembled a large study group and laid out a series of programs which might make sense for them to prototype. The Navy did the same thing some time later.

One of the programs selected by OSD was the Air Force lightweight fighter program. There was no showing at the time that a lightweight fighter would, in fact, be a worthwhile, cost effective solution to any known Air Force problem. Actually, this type of a LWF program, of course, must have been considered by the Air Force when they justified the F–15 in the first place. The Navy had certainly worried about or considered the possibility of lightweight fighters as being a solution.

I don't think that there was any justification at the beginning of the program to show that lightweight fighters in fact were going to solve any problems

AIR FORCE SELECTION OF DESIGNS

The Air Force advertised to the industry that they were going to build two lightweight prototypes, but with no consideration for production. They got bids, as I recall, from General Dynamics, Boeing, LTV, Lockheed, and Northrop. They selected the General Dynamics design as the winner of the competition, and in second place, rumor has it, was other than the Northrop design until the decision got to Washington, when Northrop became the second choice. There was some

logic to that. It was a different type of airplane, the only twin engine airplane in the competition. They were going to fly off the F–16 versus the F–17, again technology prototypes. If they ever said they were going to be competitive with a F–15, I imagine that the Congress would have cut back on procurement of F–15's. I would have if I had been there.

So it was carefully stated these were only to be developed as technology prototype planes.

Chairman McClellan. You don't think that both the F–16 and the F–18 are needed?

Mr. Spangenberg. I don't believe either is needed.

Chairman McClellan. Neither of them?

Mr. Spangenberg. That is correct.

Chairman McClellan. In other words, the existing planes you mentioned here are adequate to perform the missions that the F–16 and the F–18 are intended to perform?

Mr. Spangenberg. That is right.

Chairman McClellan. All right.

You indicated that the Navy has always insisted on a two-man plane, is that correct?

NAVY INSISTENCE ON TWO-ENGINE PLANES

Mr. Spangenberg. We had since the late fifties. We made the decision between the F8U–3 and the F–4 programs, largely on the basis that the two-man crew was going to win the war against the one-man crew airplane. Ever since that time, the Navy, on the basis of every Navy study I know of, justified the two-man crew.

Chairman McClellan. When you were comparing the F–18, you said, "The latter suffers from its one-man crew, less powerful radar, and fewer missiles, which combine to offset its predicted better reliability and maintainability characteristics."

In that statement, you are comparing the F–18 to what plane?

Mr. Spangenberg. Well, relative to the F–4. And the same statements apply to the F–14. Primarily, the reason why, in my opinion, the F–18 on an overall effectiveness standpoint, was inferior slightly to the F–14.

F–18 ADVANTAGES OVER F–4

Chairman McClellan. Are there any areas where the F–18 has advantages over the F–4? You've shown us three areas where you consider it to be inferior.

Mr. Spangenberg. Yes, sir. It has higher excess thrust, and lower wing loading, so it will turn better, and at lower speeds, and will be able to maintain rates of climb better than the F–4.

Now, this would be true from low subsonic to medium supersonic area. In the high supersonic areas, the F–4 would be better than the F–18.

Chairman McClellan. So there are some benefits?

Mr. Spangenberg. Yes, sir.

Chairman McClellan. But on the whole you think the F–18 comes out second best?

Mr. Spangenberg. Yes, sir.

F–18 AS A "DOGFIGHTER"

You also stated, "If he chooses, he can easily design a better dogfighter since he has lesser constraints and can thus defeat the F–18 in the only area in which anyone now claims its superiority over the F–14." You are talking about the enemy?

Mr. SPANGENBERG. Right.

Chairman MCCLELLAN. What do you mean by "lesser constraints"?

Mr. SPANGENBERG. Generally speaking, or really, in every case, the U.S. designed fighter will have a greater fuel load than that required by the purely defensive fighter. Since we have a greater fuel load to carry, our airplane is going to weigh more than the enemy airplane.

Assuming the same state of the art in both airplane and engine designs, it is obvious then that he can design an airplane that is lighter than our airplane and will, therefore, have higher performance than our airplane. You can also assume he will be operating in an overall command and control environment which is favorable to him, so he has that advantage going for him.

Chairman MCCLELLAN. You followed that by saying, "To win in an air-to-air war, we must invest in better weapons systems and missiles if we are to have a chance of winning."

I thought I had understood you to say that we did not need to invest in better planes, that the F–14 and F–15 and F–4 are all adequate. Is that not what you said?

F–4 REPLACEMENT NEEDED

Mr. SPANGENBERG. I am saying we don't have to design a superior dogfighter in selecting a new weapons systems because we can solve the problem in another way. In other words, shoot at longer range than he does. I think that is the only way we can, using physical facts, "win the war." I don't believe that the F–4 would be an adequate airplane 10 years from now by any means.

Chairman MCCLELLAN. But you do consider it adequate at this time—you do not think it needs replacement?

Mr. SPANGENBERG. I think that it does need replacement. It is being replaced by the F–14. I think that we should be starting on a better missile and weapons system to outfit the followon to an F–14. Certainly the enemy knows what the F–14 can do. That capability, you will remember, was the capability that we had in the F–111, and it was 1961 when we started that. So the technology, kind of knowledge that is in the F–14 system today is that which was available 14 years ago.

Chairman MCCLELLAN. At that time we were trying to build a two-man plane and we had the fatal problem in connection with the TFX, as I recall.

Mr. SPANGENBERG. It was technically impossible to meet the diverse requirements.

Chairman MCCLELLAN. I remember in that instance the Navy kept contending in public hearings that they wanted it and needed it. But correspondence after that stopped, because they were saying behind the scenes they knew it was not any good and would never work.

May I quote again:

The F–18 does not approach the 600 mile radius on internal fuel with six 250 pound bombs, which was one of the requirements in the original A–7 competition in 1963, nor does it match the 750-mile strike radius with external fuel estimated for the F–4 early in its development.

What is your reason for that statement?

Mr. SPANGENBERG. I was trying to show the capability level of an attack version of the F–18, that it is far less than had been predicted for these other programs when we started them. If we are asking for less today, it is a cinch we will end up with a considerably lesser capability when the attack version of the F–18 gets to the fleet.

Chairman MCCLELLAN. You are saying, then, that we could build a better plane if we applied all the technology—all the knowledge—that we have today?

Mr. SPANGENBERG. I am sure we could build a better plane. I am not saying it would, or should, be a lighter plane than A–18, nor that it would cost less than an A–18. I think to be useful in the future, it is just going to have to cost more than the airplane it replaces.

Chairman MCCLELLAN. You also stated:

Although there are other deficiencies in the design as it has been reported, its range performance alone is sufficient to disqualify it for serious consideration as an A–7 replacement.

Does that remark refer to the F–18?

Mr. SPANGENBERG. Right.

Chairman MCCLELLAN. Could you give us a little more detail on that, please?

F–18 (A–18) RANGE

Mr. SPANGENBERG. Well, I am talking primarily of how far it will go.

Chairman MCCLELLAN. How does it compare with the A–7?

Mr. SPANGENBERG. Just roughly half the A–7. On internal fuel, that is. Now the reason I used internal fuel as a measure of goodness in an airplane, is that we went through a cycle many years ago of allowing our designers to count on using external fuel tanks to meet normal day-in day-out operating requirements. To achieve the kind of combat performance you need, it then means you must drop those tanks. In the case of the F–18, it means that we will be dropping from two to three of the 600-gallon tanks on every mission if we want the kind of performance quoted for the airplane.

Chairman MCCLELLAN. In other words, in order to get the maximum weaponry out of it in combat, the F–18 has to drop gas tanks to give it the lighter effect needed for better performance?

Mr. SPANGENBERG. That is right.

Chairman MCCLELLAN. Then you follow on and say:

With a 50 percent higher price and a 50 percent lower capability than the A–7, the F–18 cannot be justified as an attack airplane.

Is that what you were speaking of with respect to the external fuel?

Mr. SPANGENBERG. Yes, sir. The external fuel question is but one part of the problem. My overall conclusion you have quoted correctly.

Chairman MCCLELLAN. Senator Young, any questions?

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Senator YOUNG. I have only one or two. I am taking this a bit out of context, but you say:

If the F–15 is worth buying at all, its capability must easily offset the small numerical advantage noted.

F–15 CAPABILITY

What do you think of the F–15 as a plane, its capability? How would you rate it?

Mr. SPANGENBERG. I think I would ask you "compared to what?" I think probably for the Air Force mission it is a better airplane than the F–4. I think that the Air Force really needs the capability that is in the F–14. I know that there are threats that the F–15 cannot handle that the F–14 can handle. I am sorry that the F–15 does not have the capability of the F–14. But I would certainly rate the F–15 as worth buying relative to the F–16 or the 17, or the 18.

Senator YOUNG. How would you compare it with the F–4?

Mr. SPANGENBERG. I would have trouble justifying it using the type of cost effectiveness analyses I have seen over the years. However, the Air Force did justify it in their own cost effectiveness analyses, which I have no way of really critiquing. I would accept this analysis that it is a better deal for them than the F–4.

PILOTS' VIEWS OF F–15

Senator YOUNG. You said a while ago that we should go to the pilots and those that are at the working level to get the appraisal of a plane and pay more attention to them. In the last week I flew the F–15 at Luke Air Force Base, and I visited seven or eight of the pilots, and they said if they had their choice they would rather fly the F–15 for nothing than to be paid to fly the F–4.

Mr. SPANGENBERG. I would expect them to say that.

Senator YOUNG. They are the ones that fly it and they are the ones that do the fighting. I think all of the people I talked with were fighter pilots back from the Vietnam war.

Have you ever had any experience as a pilot?

Mr. SPANGENBERG. No, sir.

Senator YOUNG. I have no further questions.

Chairman MCCLELLAN. Senator Inouye.

F–4/F–14/F–18 COMPARISONS

Senator INOUYE. Throughout your statement, it speaks of the effectiveness, capability, of the F–4, F–14, and F–18 against the enemy. How would the F–18 stand up against the Foxbat?

Mr. SPANGENBERG. It would be useless.

Senator INOUYE. Against the Flogger.

Mr. SPANGENBERG. If you got into a close-in turning engagement, the F–18 would probably beat the Flogger. It depends upon what you assume is the long-range missile capability of Flogger as to whether you win or lose the long-range engagement.

Senator INOUYE. How about the Fencer?

Mr. SPANGENBERG. The Fencer is probably less capable than the Flogger, as I remember it. It would be the same type of thing; close in the F–18 would win and long-range it is hard to say what the Soviets

are going to be doing in the time period of the mid-eighty's. They certainly have the capability of outranging an F–18 kind of airplane.

Senator INOUYE. How would the F–14 fare against the Foxbat?

Mr. SPANGENBERG. The F–14 can handle the Foxbat, which is one of the design threats for which it was designed.

Senator INOUYE. And the others I named?

Mr. SPANGENBERG. It would beat those also in long-range engagements, which is the only way we have ever been able to see we could win.

Senator INOUYE. How would the F–4 fare against the Foxbat?

Mr. SPANGENBERG. The F–4 cannot handle the Foxbat.

Senator INOUYE. Can it handle the Flogger?

Mr. SPANGENBERG. It is in the same class as the F–18 overall.

Senator INOUYE. I have here statistics which were furnished to me and I would like your thoughts on it.

Just comparing the F–18 with the F–4, A–7, and the F–14, according to this statement the F–18 is 20 percent slower than the F–4. Would that be correct?

Mr. SPANGENBERG. It sounds about right.

Senator INOUYE. The F–18 is 31 percent slower than the comparable Russian type?

Mr. SPANGENBERG. That is right.

Senator INOUYE. The F–18 is 30 percent less lethal range of the F–4 replacement?

Mr. SPANGENBERG. I presume they are talking in that specifically to the capability of the missile with a lesser radar system, so that its effective missile range is low. If that is what they mean, yes.

Senator INOUYE. The F–18 has the same weapons which the F–4 has?

Mr. SPANGENBERG. Yes.

Senator INOUYE. The F–18 is 10 percent heavier than the A–7?

Mr. SPANGENBERG. It is right around the range. In this case, you are undoubtedly talking empty weight as opposed to some of the other takeoff weights that have been quoted.

Senator INOUYE. The F–18 is 40 percent more maneuverable than the A–7?

Mr. SPANGENBERG. By "maneuverable," if that means sustained turns, yes.

Senator INOUYE. The F–18 would carry 30 to 50 percent less payload than the A–7?

Mr. SPANGENBERG. At a given range, that is right.

Senator INOUYE. The F–18 is 31 percent slower than the F–14?

Mr. SPANGENBERG. Yes; maximum speed, yes.

Senator INOUYE. That it has 31 percent less payload than the 14?

Mr. SPANGENBERG. That is probably true, yes, sir.

Senator INOUYE. That is has 25 percent less weaponry than the F–14?

Mr. SPANGENBERG. Yes, sir, about.

Senator INOUYE. And 50 percent less lethal range than the 14?

Mr. SPANGENBERG. Yes. Again that is presumably referring to a respective range at which you would fire its missiles.

Senator INOUYE. The F–18 has 75 percent less surveillance capability than the F–14?

Mr. SPANGENBERG. I presume you mean radar volume, and that would be the order of magnitude, yes.

Senator INOUYE. That the F–18 is 10 percent smaller in length than the F–14?

Mr. SPANGENBERG. Yes.

Senator INOUYE. That the F–18 is 14 percent more maneuverable at certain subsonic speeds than the F–14?

Mr. SPANGENBERG. Sure.

IMPORTANCE OF MANEUVERABILITY

Senator INOUYE. How important is maneuverability? Because I note from these statistics that the F–18 is much more maneuverable than the A–7 or the F–14.

Mr. SPANGENBERG. Well, this comes down to the dogfighting days. In a long-range Phoenix engagement or a Sparrow engagement—the importance of the kind of maneuverability that is quoted in these numbers is virtually nonexistent. Any of the airplanes have sufficient maneuverability to launch Sparrows or Phoenix and fly the type of attack for which the airplanes were designed.

If you get into a close-in dogfight, then you want all of the maneuverability you can get. Sustained turning performance is one of the parameters involved in which you would like to have an advantage. You would also like to have an advantage in instantaneous turns, where the speed bleeds off, so that you can still have a shorter radius of turn.

Senator INOUYE. It has been suggested that the prime function or only function of the F–14 is to be completely defensive. Is that correct?

"PRIME FUNCTION" OF F–18

Mr. SPANGENBERG. I think that is a preposterous statement. The factors which make the F–14 good in fleet defense also makes it good in beachhead defense and make it good for maintaining air superiority anywhere in the world, as when it is used in an escort role, or other "fighter" roles.

Any time you can outrange the enemy and keep track of more than one of the enemy at one time, it seems to me that you have a tremendous advantage over the shorter-range, virtually blind arrangement that you would have in our current F–4 kind of fighter. In that case, once you are engaged, you can see only the target you are shooting at until the missile hits. In the case of an F–14 type of capability, you cannot only see that target but you can see everything else that is going on. So you have an awareness advantage and in addition you have a system that outreaches the other guy by 50 percent or so and then you have missiles that have a higher kill capability per missile. It is hard to see why anyone who is going to fight a war wouldn't want an F–14 type of capability with a Phoenix missile. It should beat a Sparrow every time.

ANNUAL OPERATING COSTS OF F–14 AND F–18

Senator INOUYE. The Navy told the Congress that the annual average operating cost of the F–14 approximates $1,400,000?

Mr. SPANGENBERG. Yes.

Senator INOUYE. And the F–18 would be approximately $872,000?

Mr. SPANGENBERG. Yes.

Senator INOUYE. Is this element important in selecting a plane?

Mr. SPANGENBERG. Sure, it is important. You always prefer to have a low operating cost just as you would rather have a low acquisition cost. But it does not make any sense to buy a lower operating cost airplane if it ends up not being able to do the mission that is required. If you can't handle the threat—there are lots of airplanes around the country that would have a lower operating cost than F–18.

Senator INOUYE. Your conclusion, then, is that, considering all of the elements, the F–4 is a much better aircraft than the F–18?

Mr. SPANGENBERG. No, sir, not a much better airplane. Overall, I think today I would buy F–4's rather than F–18's, only because they are cheaper and have roughly the same level of capability.

Senator INOUYE But between the F–14 and the F–18, as far as you are concerned, there is no comparison?

Mr. SPANGENBERG. There is no comparison. It is a different ball game.

Senator INOUYE. Thank you.

MR. SPANGENBERG'S PRESENT WORK STATUS

Chairman MCCLELLAN. Since you left the Navy, have you since been employed by any defense industry?

Mr. SPANGENBERG. In the last 2 years, I have had a consulting agreement with the Navy. I have had ad hoc type consulting agreements with Sikorsky Aircraft and I am a member of their advisory committee.

Chairman MCCLELLAN. With whom?

Mr. SPANGENBERG. Sikorsky Aircraft. I have had a similar type of ad hoc consulting agreement with Boeing. I consulted with Boeing on ASW (anti-submarine warfare) matters and consulted with Boeing on what is called the COD program. I do not have any contractual relationships, nor have I received any money from any of the other aircraft contractors. I do have contacts with others; I talk with them but I am not paid by them.

Chairman MCCLELLAN. You are not, then, retained or regularly employed by any?

Mr. SPANGENBERG. That is correct.

Chairman MCCLELLAN. Are you a regular consultant of the Navy?

Mr. SPANGENBERG. No, sir. I am also on an ad hoc basis for them.

Chairman MCCLELLAN. So all of the work for which you receive compensation is on an ad hoc relationship, is that correct?

Mr. SPANGENBERG. That is right.

Chairman MCCLELLAN. Whether it is an airplane company or the Government?

Mr. SPANGENBERG. Yes.

NAVY INFLUENCE ON MR. SPANGENBERG'S VIEWS

Chairman MCCLELLAN. All right. May I ask you if you have conferred with experienced combat pilots and taken into account their opinion when you state that the F–18 is a markedly inferior fighter aircraft to the F–14?

Mr. SPANGENBERG. Yes, sir.

Chairman McClellan. Are your statements here based simply upon your own knowledge and judgment, or does your testimony also encompass opinions you have received from others who are knowledgeable in this field, particularly experienced pilots?

Mr. Spangenberg. All of my operational knowledge of the Navy comes from talking to Navy flyers.

Chairman McClellan. Navy flyers?

Mr. Spangenberg. Yes. I have been involved with them over the years. I think you should realize that every Navy flyer has a slightly different background, and anyone who was in the position which I was in had to evaluate the total experience of the man who was talking to you and whether or not he had total knowledge or whether he had particular knowledge on the particular subject being discussed.

I think, overall, I have been the spokesman of Naval aviation for the man in uniform that couldn't talk up when I could. I have been in many situations where I could talk and a younger officer in blue could not talk. And I was shoved forward and said, "Go tell him, George."

I think, in general, I speak for most of the naval aviation in the statement I made here. I think that there are, obviously, some people that disagree with me. I don't take any issue with their sincerity. I believe that they are wrong. I don't believe that their knowledge is great enough of all the things that we have done wrong in the past, to satisfy the future.

I think we have made enough mistakes. I have seen cases where we said, "We can't take the next step forward because it costs too much." But the step had to be taken later at an even greater cost.

I can recall very well the first mistake I made in naval aviation was believing an officer who told me the FAU Corsair, which weighed twice as much as the F–4F Wildcat, would never see service use. It would weigh too much, cost too much and it was twice as big. Obviously, we are four times that size today. I can recall Admiral Mitscher saying that the 15,000-pound original F–F proposal was entirely too big to be operating on an aircraft carrier. This type of comment was proved ridiculous. You have to discount that type of advice even from experienced naval aviators. Fortunately, there were other experienced aviators who saw the problem more clearly.

Chairman McClellan. Very well. Any further questions before we answer the quorum call?

REDIRECTION OF F–18 FUNDS TO PURCHASE OF F–14's

Senator Inouye. Sir, you stated that funds now planned for the F–18 should be redirected to first increase and then hold F–14 production at a reasonably efficient level.

What is a reasonably efficient level?

Mr. Spangenberg. We should be buying them at not less than the rate we initially planned, which was eight per month. It is very discouraging to those of us that were involved in the original justification of the program to see that the numbers that are now being quoted as overrun, which are not really overruns, but rather increases in unit costs associated with low production rates.

The rate of the airplane has been cut to about a four-per-month level, one half of the rate that it should have been at and one half the rate that we initially priced the program out on.

In the future, OSD has cut it back to where it is down to two and three a month. Now, that is a very expensive way to buy airplanes.

Senator INOUYE. The unit cost, overall?

Mr. SPANGENBERG. Absolutely. One of the real problems in F–14 total cost picture is the fact that we were forced to cut back by OSD to inefficient levels of production. This is still going on.

Senator INOUYE. So, by reaching an efficient level, you are speaking of eight?

Mr. SPANGENBERG. Eight to ten a month is what we should be buying.

Senator INOUYE. Thank you, very much.

Chairman MCCLELLAN. I have one other question before you leave. Do you have any financial interest or financial investment in any of the airplane companies?

Mr. SPANGENBERG. No, sir.

Chairman MCCLELLAN. Thank you very much. We appreciate your appearing today. Your testimony has been most interesting.

DEPARTMENT OF DEFENSE

Office of the Deputy Secretary

STATEMENT OF HON. WILLIAM P. CLEMENTS, DEPUTY SECRETARY OF DEFENSE

FUNDAMENTAL REQUIREMENTS FOR F–18

Chairman McClellan. Our next witness is the Deputy Secretary of Defense, Secretary Clements.

I see you have a prepared statement. You may proceed.

Mr. Clements. Mr. Chairman and members of the committee, I believe it is time for some plain talk on the F–18. There have been many hearings, lots of contractor-generated data, opinion after opinion on performance and military requirements, many self-interest claims and emotional appeals, and complex financial analyses in which parameters are juggled to prove various points.

All in all, I believe that a straightforward program with very clear objectives has become complicated and confusing to some—and maybe that's what some people want.

So now is the time to strip away this confusion, to get back to fundamentals and address the issues in simple terms. I believe the issues are these:

1. Is there a valid military need and does the capability of the F–18 satisfy this need?

2. What is its cost and does it save enough taxpayers' money to justify the investment?

3. Does Congress really support the effort in DOD to pursue new avenues for achieving greater military capability at lower cost?

Mr. Chairman, I would like to address each of these questions briefly and simply.

First—as to the need for the F–18 and its military value. Just as in the case of the Air Force, the aging Navy F–4's will lead to a serious gap in combat aircraft in the early 1980's. This has been long recognized and accepted.

In addition—in the case of the Navy—that light attack A–7's will require replacement starting in the mid-1980's by a more survivable aircraft having much greater fighter-like agility. These requirements have been discussed with the Congress in the past and formed the basis for the Navy developing the VFAX requirements which envisioned a reasonably low-cost aircraft operating in a dual role having both fighter and attack capability. I support these Navy requirements. They are satisfied in all essential respects by the F–18.

F–18 CAPABILITY

Now much has been alleged about the actual capability of the F–18 or the lack thereof, both with respect to the aircraft it will replace and with respect to the F–14 which it will complement. By what I consider to be detailed and rigorous Navy analysis, the F–18 is clearly superior to the F–4 and A–7 which it will replace.

In the case of the F–4, it will have greatly increased air combat maneuvering performance, a better radar, more reliability, and will come aboard the carrier more slowly and require less deck space. In the case of the A–7, it fulfills the range-payload and accuracy requirements but with vastly increased agility and therefore survivability and capacity to act in a self-escort role.

With respect to the F–14, there has been too much emphasis on which airplane is superior or inferior in simplistic terms without understanding either their mutually complementary and supportive roles or what the Navy is setting out to achieve overall.

The F–14A, with its Phoenix missile system, is a superb all-weather fleet air-defense interceptor. This is what it was designed to do and it will be unexcelled in that role for the foreseeable future.

It is, of course, excellent also in the more usual fighter roles. But it is large and complex—it is expensive to acquire and to maintain. We simply do not need all of this capability for every role. We simply cannot afford the space, the manpower, and the cost of using the F–14 for all these roles. This applies to both the Navy and the Marine requirements.

F–18/F–14 COMPARISON

The F–18 is a relatively small aircraft which, like the Air Force F–16, builds directly on the propulsion and aerodynamics technology developed and demonstrated in the lightweight fighter program and on a new generation of electronic technology.

It is clearly superior to the F–14 in air combat maneuvering and, like the F–16, will change the basic tactics of air combat and will meet the threat in this area well into the future.

The F–14 system with Phoenix missiles dominates in long-range intercept situations, while the performance and agility of the F–18 dominate in scenarios involving classical mixed force air combat at shorter range.

Like the F–16, it can operate very effectively in a dual capacity as a fighter and attack aircraft complementing the F–14. The argument, if anything, is even more compelling in this case because of the obvious constraints in manpower and space aboard a carrier. Analogous constraints apply to the field logistics support in the Marine Corps and explains why the Marines have chosen the F–18.

In fact, used with the F–14 with its two-man crew and very long-range radar, the capabilities of both are multiplied. The overall mix of F–14 fighter-interceptors and the F–18 fighter-attack aircraft provide the most relief on space, logistics, and support while simultaneously improving mission flexibility and effectiveness.

And, Mr. Chairman, this is my main point. What we are after is overall force effectiveness within realistic cost and logistic constraints

as we see them in the future rather than suboptimization of every individual element of the force. This complementarity and interdependence is a major new concept in our force-structure planning. We believe it is valid.

COST OF THE F–18

Now I would like to discuss cost. There has been much confusion in this area with all sorts of numbers and charts floating around. Some of the confusion results from the use of "life cycle costs" and the models used in their calculation.

I would propose instead to examine the fundamental cost elements and the comparative costs which have been discussed in many hearings.

In simplest terms, the development cost of the F–18 including 11 test aircraft, testing, test equipment development, as well as the aircraft and engine development, is estimated at about $1.4 billion in 1975 dollars. This number has been a consistent number in our internal deliberations and in our testimony to Congress.

The next number is the unit cost of one of these aircraft. The number which is least easy to confuse by varying assumptions and ground rules is the unit production or flyaway cost, excluding spares and startup costs. This number is $5.8 million per weapon system, which is the average cost of producing 800 F–18 aircraft in 1975 dollars.

Again, this number has been used consistently from the time of source selection, and I believe it is valid based on the preparation for the DSARC review now underway.

The other element in the overall cost equation is the operating and support cost. Detailed analyses based on operating experience, and on the engine and avionics design, show a cost slightly under $0.9 million per year per operational F–18 aircraft.

Again, this is a number which has been stable throughout our internal deliberations and testimony. It compares with the optimum anticipated cost of $1.4 million per year for the F–14A. This is a one-half million dollar annual cost difference between the F–14 and F–18.

One widely discussed comparison is between the cost of a force of F–18's and additional F–14's. Let's consider a minimum program of 800 F–18's and look at the elements of cost difference in simple terms:

Of the total, roughly 500 aircraft will be required to fill the fighter needs. Under the most optimistic circumstances the unit cost of the F–14 is $5 million higher than the F–18 for equal production rates. For 500 airplanes, this amounts to $2.5 billion favoring the F–18.

About 70 percent of these aircraft, or 350, are actually operated at any one time. The operating and support cost savings for 350 F–18's, compared to the same number of F–14's, then amounts to $175 million annually, or about $2.5 billion over a 15-year period. We would actually intend to operate the aircraft for longer than this.

For the remainder of the initial 800 aircraft, the F–18's will be used in the attack role. The cost would exceed similarly equipped A–7's by about $400 million. However, in the absence of the F–18, a new attack aircraft having the same general characteristics as the F–18 would have to be developed and introduced by the mid-1980's. The unit cost of this aircraft would at least equal and probably exceed that of the F–18 because of the lower numbers produced.

Offsetting this roughly $5 billion savings is the investment cost of $1.4 billion for the F–18. This is, however, roughly comparable to the $1 billion plus investment required for a new attack aircraft.

Therefore—in the aggregate—we achieve a net savings in the $4½ to $5 billion range, and this result will not vary significantly for a wide range of assumptions on either side.

"BREAK-EVEN" POINT

There has been a lot of discussion of the so-called "break-even point" on this program—the point where the costs incurred in the new product are offset by the savings resulting from this product. My way of getting at this point is to ask "how many F–18's do we need to buy and operating before we start to make a net savings?" We calculate this "break-even" number to be about 250 aircraft—or 350 to 400 if we apply discounting.

Since we are planning to buy significantly more than 250 F–18's—probably in excess of 800—and to operate them over longer than the 15 years used in the calculation—probably at least 20 years—this is clearly a sound investment.

Any investment involves front-end cost. The main point here is that the Navy believes this to be a wise investment of our increasingly constrained investment dollars. We have consciously chosen this investment among other priorities because of its large payoff.

I believe that these relative costs pass any test of reasonableness. For example, the F–18 weighs about 60 percent of the F–14 and has much simpler avionics, so a cost of 60 percent as much is reasonable.

The same applies to support and operation, especially since the F–18 uses a new generation of technologies especially applied to reduce these costs. As compared with the Air Force F–16, the unit cost will be roughly $1 million higher, again not surprising in view of its somewhat greater weight and all-weather radar missile and ground attack capability.

SUMMATION

In summary, I have tried to convey that we know what we are doing and why we are doing it. And I believe that what we are doing is consistent with the desires of Congress to support us in the development of lower cost approaches to satisfying our military capability requirements.

In this case, I believe we have been responsive to congressional directive. We have in the AF F–16 and the Navy F–18 programs reversed the upward cost and complexity trends. We have prototyped and tested these aircraft, providing high confidence in the cost and performance projections of both programs.

Both programs warrant your full endorsement and support. The only interests served by denying the requested funds for the F–18 are those of the proponents of expansion of the high end of the mix using the old rationalizations of the past and those of the contractors who stand to lose as a result of this program.

In this program, the Navy and Marines are getting what they want and need for their force structure at what I believe to be an ap-

propriate and affordable cost. I support them and applaud them in this effort.

Now, Mr. Chairman, that completes my formal statement. I would like to make two other comments that are not included in the statement.

One has to do with the discussion that took place prior to our lunch break on the intent of Congress and the response of the DOD, OSD and the Navy with respect thereto.

I would like for you and your committee to know that we spent many, many, literally hundreds of hours of our time and effort trying to work within the framework of the intent of the committee's charge to us to use a derivative airplane.

We tried to keep the committees informed, as you are well aware. And in the final process, we secured permission from the committee to do what we did. So I don't want it said that we were flagrant in our course of doing what we did, contrary to the wishes of the Congress.

CORRESPONDENCE

Chairman McCLELLAN. The correspondence advising the committee of Department of Defense actions, as well as Chairman Mahon's and my own response, will be inserted at this point in the record.

[The correspondence follows:]

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C.

Hon. JOHN L. McCLELLAN,
Chairman, Committee on Appropriations,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I am writing to inform you of the current status of the Navy's evaluation of proposals for its Air Combat Fighter (NACF). Pursuant to your letter of November 21, 1974 approximately $12,000,000 of the $20,000,000 appropriated for this effort was applied toward the dvelopment of derivative NACF designs by both of the original Air Force ACF competitors. At the time of the Air Force ACF selection last month the Navy's own evaluation was still in its early stages. In view of the considerable investment already made toward the design of derivative aircraft by the two contractors, we have instructed the Navy to complete its evaluation of both firms' proposals in a fully competitive atmosphere.

The Navy expects to present the results of its evaluation in early May. If none of the proposed designs can satisfy the solicitation criteria we will terminate the present competition and perform further trade off analysis of stated requirements in an attempt to meet the desired goal of a lower cost alternative fighter-attack aircraft for Navy use. If any or all of the derivative designs are acceptable the Navy will likewise recommend its choice.

Should an acceptable design be found it will be necessary to use the remainder of the present appropriation to contract with the selected firm to refine its design and sustain its engineering effort pending formal program approval to undertake full scale development in FY 1976. I believe this is a prudent course of action whichever firm is selected and I would appreciate your concurrence. We will also advise you should the evaluation disclose a need to revise our current budget figure for this aircraft in light of the considerable redirection which has overtaken its original submission.

Sincerely,

W. P. CLEMENT, Jr.

CONGRESS OF THE UNITED STATES,
HOUSE OF REPRESENTATIVES,
COMMITTEE ON APPROPRIATIONS,
Washington, D.C., March 13, 1975.

Hon. WILLIAM P. CLEMENTS, Jr.,
Deputy Secretary of Defense,
Washington, D.C.

DEAR MR. SECRETARY: This is to acknowledge your letter of March 7th with regard to the plans of the Department of the Navy to evaluate competitive designs of the Navy's Air Combat Fighter.

You state that the Navy expects to complete its evaluation in early May and that if an acceptable design is found, the Navy will use the remainder of the present appropriation, approximately $8,000,000, to contract with the selected firm for design and engineering effort.

I have no objection to the approach you have set forth. However, the Subcommittee on Defense Appropriations expects to carefully review the FY 1976 funding requests and I could not comment on possible Committee action on the FY 1976 request at this time.

Sincerely,

GEORGE MAHON, *Chairman.*

U.S. SENATE,
Committee on Appropriations,
Washington, D.C., March 17, 1975.

Hon. W. P. CLEMENTS, Jr.,
Deputy Secretary of Defense,
Washington, D.C.

DEAR MR. SECRETARY: This is in response to your letter of March 7, 1975, concerning the Department of the Navy's evaluation of the proposal for a Navy Air Combat Fighter.

The Navy plans to complete the evaluation within the next few weeks and either terminate the competition or conduct further tradeoff analysis. If one of the designs is selected, I understand that the remainder of the funds appropriated for the Navy Air Combat Fighter study will be used to refine the selected design.

The Committee has no objection to your plans for expending the amount appropriated in fiscal year 1975. I understand that you will notify the Committee of a final selection in May so that the Committee will have the necessary information during consideration of the fiscal year 1976 request for the Navy Air Combat Fighter.

With kind regards, I am

Sincerely,

JOHN L. MCCLELLAN, *Chairman.*

BLACKMAIL

Mr. CLEMENTS. Quite to the contrary, it caused us considerable worry. We gave it a lot of thought and spent a lot of effort in trying to do what you wanted us to do.

Then, when we found we couldn't, we tried to keep everybody informed as to what we were doing and got permission of the committee to do it.

The second point I would like to make has to do with blackmail. It is an ugly word and it is a word that raises my hackles. I would like to say that in almost three years now, I have been in the Department of Defense and OSD, I know of no instance where anyone has been threatened in any way, shape or form.

To the contrary, all of these people sitting around the table, whether it is Admiral Holloway or part of the people on the OSD staff—like Dr. Currie—or in the Navy Secretariat—like Dr. Potter and General Wilson—these people know and will tell you, in every instance I know

anything about, they have been encouraged to express their views openly and freely. I am sure they will do the same with this committee. I wouldn't want it inferred otherwise.

Thank you.

QUESTIONING BY COMMITTEE

Chairman McClellan. Let me ask you one thing. I have gotten the impression that the same situation prevails now that did in old TFX days. I don't know the true state of affairs today, but you can sit here a long time and never convince me it didn't prevail then.

Mr. Clements. I was not here then, Mr. Chairman. I can't comment.

Chairman McClellan. Anyway, what we are trying to do here is unravel a problem that is occurring. With respect to the selection of the F–18, was the LTV contested?

Mr. Clements. Yes, sir.

Chairman McClellan. Were they given the same opportunity to develop a plane outside the derivative requirement as was given to McDonnell Douglas?

Mr. Clements. Let me explain what happened here. I would be delighted to lay that to rest.

We had the prototype F–16 and F–17 built by General Dynamics and Northrop when it was decided that the best procedure would be for the Navy to try to use one of these airplanes and not start a brand new program.

These two contractors were contacted and they were told that this was the intent of the Navy. I talked to them myself, and I am sure that Admiral Lee did, as well as Admiral Houser and Dr. Currie.

We all talked to the contractors and we told them that they should choose partners, because in both instances—Northrop and General Dynamics—they had not had carrier airplane experience, and the Navy felt that this was a situation——

Chairman McClellan. That was at the inception of the whole program?

SEQUENCE OF EVENTS

Mr. Clements. Yes, at the very beginning. They told these two contractors in order to get the expertise that was required, that they should go to industry and choose a partner each, and we didn't care who it was. But the requirement should be that they have Navy airplane manufacturing experience . . . carrier, capable airplane experience.

So it was determined that these two contractors choose their partners. In one case Northrop went to McDonnell Douglas, and in the other instance General Dynamics went to LTV. We, the OSD, Navy, had absolutely nothing to do with it. That was a free choice, and all arrangements were made by the contractors.

After they had chosen their partner, proposals went out, briefings took place, and so forth. At that point, we began to hear from LTV and not General Dynamics. LTV took the lead in that relationship because it was going to be a Navy airplane. LTV wanted to start submitting variations of other than just the one type of airplane.

So to make a long story short—and my associates here in Navy can always comment, as they will—in the final analysis, LTV submitted three airplanes.

THREE LTV DESIGNS

The first one was a direct variation of the F–16, and it did have quite a bit of commonality to it. They knew, and acknowledged subsequently, that it really was not carrier capable. Therefore, they felt the need for another airplane, so they deviated still further. This one had very little commonality.

They decided that airplane was not appropriate, either, and finally submitted a third airplane that was just as different as daylight and dark. It had no relationship, whatsoever, to the F–16—different engine, different size, different weight, different everything.

So LTV, in this instance, actually submitted three airplanes for their proposal.

Now, some of my associates might care to comment, and maybe they can expand on it if you want more information.

Chairman McCLELLAN. That does not quite answer my question.

Mr. CLEMENTS. Sorry. I must have misunderstood.

Chairman McCLELLAN. At the time it was determined that neither could produce a plane as a derivative of the F–16 and you selected McDonnell Douglas, did LTV then have the opportunity to submit a plane, another prototype design?

Mr. CLEMENTS. Mr. Chairman, they already submitted three.

Chairman McCLELLAN. I understand. But in all of those times it was still under the constraint of trying to make it a derivative of the F–16's, was it not?

Mr. CLEMENTS. That is what they were trying to do. But at the same time Northrop, McDonnell Douglas just were doing the best they could to submit a derivative of the F–17, which they did.

Chairman McCLELLAN. But the F–17 was not selected.

Mr. CLEMENTS. By the Air Force you mean?

Chairman McCLELLAN. That is right.

Mr. CLEMENTS. But we already, before that time, had gone to the committees and told the committees if we were going through this exercise, we had to have the concurrence of the committees in Congress to do this because the Air Force, by this time, had made their selection and it would have been a useless exercise. It would have predetermined what the outcome would be. It would have had to be a derivative of the F–16, and Northrop and McDonnell Douglas would have played no role in that.

Chairman McCLELLAN. Are you contending that the F–18 is a derivative of the F–17?

Mr. CLEMENTS. There is no question about it. It has at least 85 percent commonality with the YF–17.

Chairman McCLELLAN. And the other did not have? What percentage did it have?

Mr. CLEMENTS. I have to ask Admiral Lee.

F–16 COMMONALITY

Admiral LEE. As Mr. Clements stated, LTV submitted three different designs, three different proposals. Let me give you the commonality percentages for the three.

We estimate that the commonality—and I will have to number them, and take them in order. The one that was most similar to the F–16. They called that the "1601."

Chairman McCLELLAN. And what was its percentage of commonality?

Admiral LEE. It was about 60 percent common with the F–16.

Chairman McCLELLAN. All right, proceed.

Admiral LEE. They submitted another called the 1600, which was roughly—and I am giving you an opinion at this time, since we didn't actually count the parts—that it was about 15 percent common with the F–16.

Then they submitted still a third airplane and called it 1602. We feel that it was no more than 1 or 2 percent common with the F–16. A few things like the control system, hydraulic system, and so forth. Like the control systems, some internals were common. But it was no more than 1 or 2 or 3 percent common with the F–16. It was essentially a new airplane.

Chairman McCLELLAN. How many prototypes or designs did McDonnell Douglas submit?

Mr. CLEMENTS. Just the one.

Chairman McCLELLAN. And the other submitted three?

Mr. CLEMENTS. Yes, sir.

Chairman McCLELLAN. Then your contention is that they had every opportunity to compete?

Mr. CLEMENTS. Yes, sir.

I want to emphasize now, Mr. Chairman, that the Air Force rejected the YF–17 derivatives while the Navy was in the process of this evaluation between these two contractor's teams. We, in good faith—really in good faith—couldn't just suddenly say we are not going to consider this other airplane, because at that time a significant effort had been made by both contractors and that process needed to go forward in a legitimate and completely good-faith manner.

F–18 QUALITY

Chairman McCLELLAN. Let's talk about the quality of the F–18. You heard Mr. Spangenberg's statement—would you care to comment on it?

Mr. CLEMENTS. Well, I think my statement, Mr. Chairman, speaks for itself. I don't agree with George. He knows I don't agree with him. I don't feel that he is stifled in any way. When he was in the building, I didn't have any impression he was stifled, either.

Chairman McCLELLAN. He made some pretty strong statements about the capability and performance of the F–18. Do you not have any comments on that?

Mr. CLEMENTS. I think it would be entirely appropriate for the Chief of Naval Operations, Admiral Holloway, to respond.

Chairman McCLELLAN. He can testify in a few moments, if you wish to defer that question.

Mr. CLEMENTS. No, sir. I think my statement speaks for itself.

Chairman McCLELLAN. Senator Young, do you have any questions?

Senator YOUNG. Yes, I have one. You stated:

> We have in the AF F–16 and the Navy F–18 programs reversed the upward cost and complexity trends. We have prototyped and tested these aircraft, providing high confidence in the cost and performance projections of both programs.

I didn't know the F–18 was a prototype.

Mr. CLEMENTS. Probably we are at fault here, Senator. Because as we got into the program, we decided that rather than call it the YF–17,

which was a prototype under the auspices of the Air Force, the Navy needed a new number. So we changed the number from the 17 to the 18. Dr. Potter and I did that one night about 6 o'clock. There is really no significance to it.

Senator YOUNG. What about the engine? I understand the engine for the F–18 will not be ready for 3 or 4 years.

ENGINE COMMONALITY

Mr. CLEMENTS. Well, we are going to grow the engine. The engine probably is about 40 percent, or thereabouts—and Admiral Lee might comment, or Admiral Houser might comment on it. But the basic engine, the core of that engine is about 40 percent of the engine that was in fact in the YF–17.

Now there is about 60 percent of the engine that will grow, and it will be different, as you are saying, from the basic YF–17 engine.

Admiral Lee, would you care to comment on that?

Admiral LEE. Yes, sir. As was pointed out this morning by GAO, one of the allegations made by LTV involved the F–404 engine.

McDonnell Douglas had been allowed to use the new engine. It was reported in the GAO report that after auditing the F–404 engine, it is nothing more than a growth version of the YJ–101, which was in the YF–17 and which had been under development since 1971 by General Electric, Northrop, and the Air Force.

The change from the YJ–101 to the F–404 was motivated by a desire for increased thrust, which the airplane needed. The fan diameter was increased nine-tenths of an inch. The fan in the front part of the engine, and the afterburner, the afterpart of the engine diameter was increased by about 2 inches. The turbine inlet temperature was increased by about 50 degrees.

These changes are relatively moderate in going from the YJ–101 to the F–404. Your own organization, the General Accounting Office, audited and verified the facts, which I am just giving you, in their report.

Senator YOUNG. That does not answer my question. General Electric will be making the engine?

Admiral LEE. Yes.

Senator YOUNG. When will they have it ready to go into production?

Admiral LEE. About 1978.

Senator YOUNG. That is about 3 years?

Admiral LEE. About 3 years.

Mr. CLEMENTS. Senator, the airplane and engine will come along together. The engine will not be a delaying factor in acquisition of the airplane.

Senator YOUNG. Will the airframe be ready before the engine?

Mr. CLEMENTS. No, sir. And I would like to ask Admiral Lee, if you don't mind. I said it was about a 40/60 part-count commonality. Dr. Currie tells me I am low on it, that it is much higher than that.

Admiral LEE. Yes, sir. We think it is much higher. Maybe 80 to 90 percent commonality between the YJ–101 and F–404.

Mr. CLEMENTS. This is important, because this morning Senator Goldwater was talking about whether this was, for any practical purpose, a brand new engine, and so forth. Admiral Lee is saying that part count between the engine in the YF–17, which was tested over a period

of almost 2 years now, is 80 to 85 percent the same as the engine that is going to be in the F–18. It is very important.

Senator YOUNG. That is all, Mr. Chairman.

Chairman MCCLELLAN. Very quickly, the engine in the F–16 is a Pratt-Whitney, isn't it?

Mr. CLEMENTS. Yes, sir.

Chairman MCCLELLAN. And this is GE?

Mr. CLEMENTS. Yes. General Electric.

Chairman MCCLELLAN. And so far it is about 60 percent?

Mr. CLEMENTS. No, sir. That engine was flown over a period of about 2 years in the 17 airplane—the YF–17. All during the prototype testing that engine was flown and tested.

Chairman MCCLELLAN. And it developed along with the YF–17, then?

Mr. CLEMENTS. Yes, sir.

Chairman MCCLELLAN. How far is it developed now?

Mr. CLEMENTS. It has over 700 hours on it in flight—flight hours.

Chairman MCCLELLAN. Well, are further developments being made on that engine?

Mr. CLEMENTS. We are increasing the thrust of it.

And by growing the engine, we are going to change the part count by about 20 percent, but the engine will be 80 percent of the basic engine that was in the YF–17.

Chairman MCCLELLAN. Let me ask then, why will it take until 1978 to develop it, if it is only going to change by 20 percent?

Mr. CLEMENTS. I don't know.

Admiral Lee?

ENGINE DEVELOPMENT TIMETABLE

Admiral LEE. Mr. Chairman, the YJ–101 engine was a prototype. General Electric only built seven of the engines and never had hard tooling for it. It was strictly for the YF–17 program. Since developing that engine—the YJ–101—they only ran about 1,200 hours in the test cells and 700 flight hours with the two YF–17's.

Now the engine needs the changes I have described. We have to get tooled up for building the engine. Also, in the normal engine development, we run about 10,000 hours of test cell time to check the durability of everything from bearings to turbine blades to the fan. In a normal development, about 10,000 hours of test time.

So for these seven engines, we think they have done remarkably well. It was an experimental prototype engine built by hand, for the most part.

We are going to start at the point where they left off and pick up an orderly development program and go through these thousands of hours of testings, which are required to have a reliable engine. We expect to qualify this engine in 1979.

PRODUCTION AGREEMENT STATUS

Chairman MCCLELLAN. Mr. Secretary, are these two planes, the F–16 and F–18, at the stage where we can enter into production agreements? Is that what you are proposing to do for both?

Mr. CLEMENTS. Yes. We are certainly on the 16. We have not reached that stage yet on the 18. Perhaps Admiral Lee would want to comment on where the Navy is. Or Dr. Potter.

Chairman McCLELLAN. I would appreciate your comments, Admiral.

Admiral LEE. Yes, sir. On May 2, the winner of the source selection was announced. Since that time, we have been in discussions with Dr. Currie's office in defining the airplane. We also have conducted about 150 trade studies to try to improve the airplane and more precisely define the various components that we would like to have in it.

Now, we are just about prepared to go to what is called DSARC II, which is the mechanism used in the Department of Defense for the Secretary to approve full-scale development of a weapons system.

We now have sustained engineering contracts with McDonnell Douglas and General Electric, and full-scale development contracts are dependent on two things.

First, getting congressional approval. The Congress has to approve this program in the fiscal year 1976 budget. Second, getting approval of the Secretary of Defense through the DSARC process. We are ready to go to the Defense System Acquisition Review Committee and get their approval, provided the Congress approves it beforehand.

That is where we stand now.

PROTOTYPE PROCUREMENT CONTRACTS

Chairman McCLELLAN. How long will it be or do you anticipate it will be before we will be in a position to make procurement contracts?

Admiral LEE. Well, we are ready now. We have the final proposals in from General Electric and McDonnell Douglas, and we can sign a contract with those two companies next week. But——

Chairman McCLELLAN. Then you are ready?

Mr. CLEMENTS. Not until you give us the money, Mr. Chairman.

Chairman McCLELLAN. I understand that. I was asking if you are ready for procurement money.

Admiral LEE. May I make another comment? This contract we would sign would be for 11 developmental airplanes.

Chairman McCLELLAN. The first contract would be for only 11 airplanes?

Admiral LEE. Eleven prototype airplanes for all the things we have to do to it, from carrier suitability to fatigue testing to meet all of the performance specifications.

Chairman McCLELLAN. Is that the same situation with respect to the F–16?

Mr. CLEMENTS. Yes, sir. It is really a test-and-evaluation process.

Admiral LEE. And the final procurement decision, Mr. Chairman, would not be made until about 1978 or 1979.

Chairman McCLELLAN. I see. That is on each plane?

Admiral LEE. Well, on the 18, which I am qualified to comment on.

Mr. CLEMENTS. Mr. Chairman, excuse me. I am not sure I understood what you asked, but I would like to comment on your production figures. You used the term "production," and that is not exactly the same term we use.

Chairman McCLELLAN. You give me the correct terminology and I will ask it that way.

Mr. CLEMENTS. Before we go into what you are terming a production contract, we will have to take the 11 airplanes—in the case of the Air Force, I think it is 8—and we are going to have to test those airplanes. This process might go 2 years or 18 months before we make a firm production contract.

Now I think that is really the answer you were looking for.

Chairman MCCLELLAN. That is what I was getting at. I recognize that you have to have prototypes for evaluation testing first. But you are ready now for the prototype procurement?

Mr. CLEMENTS. Yes.

COMMENTS ON SUGGESTION TO REOPEN COMPETITION

Chairman MCCLELLAN. This morning one of our colleagues gave us his views on this situation. As I recall, his suggestion was that we should give each contestant another $15 million and let them work on their designs for up to another year before making our decision.

He felt it would give us better assurance of achieving the desired results, and in this way, it would make a better contract.

What do you think about that suggestion, and what would be the effect with respect to the delay?

Mr. CLEMENTS. Mr. Chairman, I was interested in hearing what the Senator said. I knew that he had these kinds of feelings, and I heard him express them before.

Frankly, I don't think a useful purpose would be served by doing what he suggested. First, I think that in a sense of the state of the art, or the technology as we know it today, for these two airplanes and what we are requiring of them and what their mission will be, the gain of taking an additional process of 2 or 3 years—which I think his suggestion would involve—we would not gain in that 2 or 3 years useful technology commensurate with the cost, the time and the effort

EFFECT OF DELAY

I think that—and I am dependent upon our advisers in both the Air Force, Navy, and OSD—we would end up with substantially the same airplanes that we have here now in the 16 and 18. If we massage them thoroughly for a couple of years, we would not advance, in any significant manner, the state of the art or the technology as we know it today.

Now, it could well be that the Navy—or you should ask them if they agree with that. Because this is a question that there could be some debate on.

Chairman MCCLELLAN. We will receive their testimony in a moment, but I wanted to ask you that question.

Mr. CLEMENTS. Do you agree with that?

Dr. CURRIE. Yes.

Chairman MCCLELLAN. We respect higher authority. Now that was his proposal, and I believe it applied to all prospective bidders. But suppose it was limited just to the two original competitors—would your answer be the same?

Mr. CLEMENTS. Would be substantially the same.

Mr. Chairman, I want to make this clear. I have no background in airplane design and I don't fly airplanes. This is not my back-

ground at all. And contrary to what has been inferred here today—in my case—the wisdom flows from down upward. I may be making the decision, but you can be sure I am very carefully listening to the people within the building, both on the civilian as well as on the uniformed side, to advise me and give me their best opinions.

Chairman McClellan. I am confident of that. As a result of that advice, I wanted your judgment for the record.

Senator Pastore.

PRICE ISSUE

Senator Pastore. Who drove up prices on this issue of price? Do you envision that as being a difficult thing before you?

Mr. Clements. No, sir. I have explored that in some detail with the General Electric people, as has Dr. Currie through D.D.R. & E. and the Navy.

We also discussed this with our Air Force associates as to their opinions. Because you must remember that they were involved in the prototype evaluation of this airplane over a period of months. I think that we are all of the opinion that growth possibility is there, and it will not be difficult to achieve.

Senator Pastore. Does it encounter any new design?

Mr. Clements. No, sir.

Dr. Currie. To give you an idea, it is about a 6-percent size change from the original YJ–101 engine that flew in the 17 prototypes. The inlet diameter is increased about nine-tenths of an inch. There are some changes in the back of the engine—the way the fuel and air are mixed together. But the core of the engine is exactly the same, identical in the parts.

Senator Pastore. The same price?

Dr. Currie. I would say that this program in this engine development, as we look at it now, is coming off a greater base of actual engine testing and design experience than any engine in recent history. Of course, engine technology is difficult. But even the F–100 engine, which completed its development almost 2 years ago on paper in the sense of being fully qualified, we have invested well over $100 million in that engine which powered the F–16 and F–15 for the Air Force during that time. And the changes are roughly comparable.

Senator Pastore. What puzzles me is you make it sound so simple—that this is what you need and this is a plain way of doing it.

Then we have testimony of a man like Barry Goldwater. And those are knowledgeable people. I mean, is this an interservice controversy? What the devil is going on?

Mr. Clements. I am not sure I know. I would like to know myself.

Senator Pastore. Here we are with reputable people from the Navy—very distinguished and dedicated people to their country—and they come and say, "This is the type of plane we ought to have and at this time it will cost us some money."

Then we have other people that say, "No, discard the whole thing."

This makes an awfully complex situation. To me, it sounds simple. If this is the plane, this is the plane.

DIFFERENT PRICE STATISTICS

Mr. CLEMENTS. I sure wish Senator Goldwater and Senator Tower, for example, would have been here with some of the information that perhaps they thought was correct. We could have corrected it for them.

Because I really don't think that some of the basic facts are well understood by them. If our facts are wrong, we want to know it. My God, we have worked untold hours trying to develop this information and to make a careful, well-conceived decision. If we are wrong, we want to know where we are wrong.

Senator PASTORE. From where you sit, I don't think you are any more favorable to the Navy than Air Force. You are responsible to both.

Mr. CLEMENTS. I am not at all. That is exactly right.

Senator YOUNG. Will you yield there, Senator?

You hit the nail on the head. The problem on the floor is they will quote one set of facts and we will quote another.

Senator PASTORE. That is all right. But we are here listening to the testimony and they are not. Naturally, of course, it should be in their interest, as much as it is in our interest, to make sure we have the right plane.

Mr. CLEMENTS. Absolutely.

Senator PASTORE. That is fundamental. I don't know how there can be so much controversy about something that appears to me to be rather simple.

Chairman MCCLELLAN. Senator Inouye.

Senator INOUYE. Thank you, very much.

Mr. Secreteary, you indicated in the testimony one of the major issues involved in the matter here is cost. You also have correctly described some of the data that we have been using and contractor's various data.

Obviously, I am not an expert. Very few of us are experts. We don't have the wherewithall, the personnel to come through with all of these complicated figures. I have here a simplified set of numbers which I would like your thoughts on.

The Department, in 1974 and on to May 6, 1975, claims that the lightweight fighter would be less capable, about half of the cost of the F–14. Is that a correct assessment?.

Mr. CLEMENTS. Less capable and about half of the cost?

Senator INOUYE. Yes.

Mr. CLEMENTS. Yes, sir.

COST COMPARISONS

Senator INOUYE. The Navy testified that through 1985, the F–18 will cost about $700 million more than the F–14.

Mr. CLEMENTS. No, sir, that is not correct. Unless you take certain numbers. It depends on what unit cost they are using. Whether they are using 400 airplanes or 800 airplanes, which could affect the unit production costs.

Senator INOUYE. This is the schedule, that you have the production on up through 1985?

Mr. CLEMENTS. I don't know what it is, Senator.

Senator INOUYE. This is part of the testimony you gave.

Mr. CLEMENTS. This is the total program, is it? Are you saying I said that?

Senator INOUYE. No, it is the Department of Navy's testimony for the program through 1985.

Mr. CLEMENTS. I would like Admiral Houser to comment, because I don't know what the numbers you are using are. Those are his numbers, apparently.

Admiral HOUSER. That is probably right, although I would like to confirm it, Senator. We had computed a crossover figure for the F–14 and F–18 program which would occur slightly after 1985.

Therefore, until that time, the cost of the F–18 program would be more than the cost of the F–14 program. This is not a direct comparison of the cost of the airplanes, however, but it reflects how they would be phased into the inventory different production rates, and other things. It is a total program and not simply a comparison of the relative cost of the airplane.

Senator INOUYE. But the R. & D. investment on the F–14 has been put together already?

Admiral HOUSER. That is correct.

Senator INOUYE. So we are talking about what would be appropriated in the Appropriations Committee here?

Admiral HOUSER. That is correct.

Senator INOUYE. So you would say that statement is not far from wrong?

Admiral HOUSER. I said that is what we testified to then.

Senator INOUYE. $700 million?

Admiral HOUSER. The figure is approximately $700 million. There have been some changes since that time, which would indicate that might be slightly lower.

Senator INOUYE. Then for the first 400, using 1975 dollars, you are today suggesting that the F–18 will cost $5.3 billion and the F–14 will cost $4.6 billion; is that about correct?

Admiral HOUSER. Is this on a 400-airplane program?

Senator INOUYE. Four hundred.

Admiral HOUSER. Yes. That would probably be correct on a 400-airplane program. We did not design the F–18 program, however, to build only 400 airplanes.

Senator INOUYE. Then on the second 400 F–18's, to replace A–7 aircraft acquisition costs, F–18 will cost $2.4 billion for the next 400 and the A–7 is $1.66 million. Would that be about right?

Admiral HOUSER. The $2.4 billion sounds correct. I would like to check the other one, sir.

[The information follows:]

Four hundred A–7's would cost $1.96 billion in fiscal year 1975 dollars.

SAVINGS IN PRODUCTION COST

Senator INOUYE. After these two combine, making the full 800, unless my mathematics is wrong, the 800 F–14's and A–7's would cost $6.26 billion and the 800 F–18's would cost $7.77 billion. And in 1975 dollars, the F–18 cost would be $1.51 billion more.

Now I want to know where the savings come in?

Mr. CLEMENTS. The fallacy of those numbers, Senator—and this is where part of that confusion comes in—is first of all, when you use the A–7 number out there, this 1.66 figure and you are using that on some volume basis of 3 to 400—I don't know which——

Senator INOUYE. Four hundred?

Mr. CLEMENTS. Four hundred. That is a fallacy, because the Navy is not going to use that A–7. They are going to have another airplane. If we don't buy the F–18, and you go to the F–14 route, sometime in the next 2 to 3 years they are going to start a program on a new attack airplane and you are going to have some R. & D. costs in there and you are going to have a unit cost, in my judgment, that will be higher than the F–18.

There is a fallacy in that kind of number. It is not valid because that is not the way it is going to happen. And the Navy will tell you this. They are going to have to have, or will want and will come to Congress and will validate a requirement for a new attack airplane, if you give them all F–14's at this point.

Senator INOUYE. What is the cost over a time for the 14 and 18? Crossover time is the question.

CROSSOVER POINT FOR PROCUREMENT

Admiral HOUSER. The crossover point for procurement only would come at about 430 to 450 airplanes.

Senator INOUYE. At that point, 14's and 18's would be equal to unit cost?

Admiral HOUSER. No, sir. The 14's and 18's—the programs would cost the same. The F–18 would have cost much less, per unit, but you have to spend the R. & D. funds to get the program started. When I have an opportunity to speak, I have a graph I think will clear it up.

Senator INOUYE. Yes.

Admiral HOUSER. The fact of the matter is, Secretary Clements said there would be another R. & D. bill that will have to be paid, anyway—probably on the order of the same amount as the F–18. The Naval Air Systems Command has developed a parametric, new, light attack airplane in which the R. & D. bill would be only slightly less than that for the F–18.

Senator INOUYE. If the Navy is called upon to follow Senator Goldwater's proposal—that is, to stop the present development of the 18 as conceived at this time and to continue the acquisition of the 14 and, at the same time, begin developing a new light attack aircraft—and assuming that what Senator Goldwater says is correct—that you may be able to develop a light aircraft that would be less expensive than the 18—would you be willing to go through with this?

Mr. CLEMENTS. I think you should ask the Navy.

RAMIFICATIONS OF HALTING DEVELOPMENT OF NAVY F–18

Dr. POTTER. Let us answer this thing down the line because there are several implications to your question. There is an overall Department of the Navy question. There are different situations within the two services separately—that is within the Navy and Marine Corps. I would like to ask the two service chiefs to respond for their services.

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As far as the Department of the Navy is concerned, a delay does two things to us. If we were to delay the present program by about 1 year however it gets reconfigured or however it comes back into being, the loss of the year will means that we will be facing an inevitable and appreciable shortfall in our fighter inventory. The Navy answer to that problem can be to buy more F–14's. I would like to ask Admiral Holloway to discuss that.

But the impact on the Marine Corps is more difficult to describe. The Marines have chosen, for good and sufficient reasons, to go with the F–18. They face a different kind of problem about the years 1981–82. The overall plan of the Department of the Navy would then be upset considerably by the process of delay and I think we would, in the end, cost ourselves a great deal more money. As a Department of the Navy position, we do not choose to do this.

The chairman has stated our views correctly. This is something we have thought about for a long, long time and we do believe in balancing the total Department of the Navy needs. The program we have come forward with is the one that best serves the total Department of the Navy interests.

Senator INOUYE. If I may proceed with that, the question I asked of Mr. Spangenberg, the whole list of comparisons—you were here at that time, weren't you?

Dr. POTTER. Yes.

Senator INOUYE. Was the data correct?

Dr. POTTER. Within my knowledge it sounded like a correct appraisal.

Senator INOUYE. If that is the case, it would appear to me—and I am not a pilot—that the 14 is far superior to the 18 and that the 18 and the 4 would be neck to neck.

Dr. POTTER. Senator, I am not a pilot, either, nor am I an aircraft designer, so I would like to respond to you from my management understanding of this situation. I have done in this case precisely what Secretary Clements has done—that is, turn to my military advisors for questions of military adequacy. Mr. Spangenberg is one of the very premier aircraft designers of the Nation and certainly of the Navy. We are very proud of all of the things he has done technologically and I trust his technical judgment.

On matters of military utility, however, I turned to military people for those answers and I will respond to you in the following way: Yes, I heard all of the numbers and I think I understand what those numbers mean. Understanding those numbers, though, does not tell me whether they encompass the whole of military utility. For that I have to turn to those who have the problem of balancing our forces.

If my son comes to me and asks for a swimming pool versus a badminton court in our backyard, I am the one with the overall responsibility for balancing my family's needs for clothes and food and recreational facilities. In this situation we have a military need that has to be balanced with many others and that is up to our service chiefs on the issue of military utility. I have no quarrel with the numbers, then; I have a quarrel only with what they mean in terms of military utility. May I defer now to the service chiefs?

Senator INOUYE. Yes.

MEANING OF DELAY IN DEVELOPMENT

Dr. POTTER. There are two questions. The first has to do with the meaning of a 1 year delay, and the second with the military meaning of the numbers?

Mr. CLEMENTS. Two years.

Dr. POTTER Two-year delay.

Admiral HOLLOWAY. Mr. Chairman, I would like to back off a little bit because I think we have lost the perspective of the problem. I don't think we can look at the Navy fighter requirements or the F–18 program in isolation, whether we are talking about the performance of the aircraft or the cost of the aircraft or the procurement system.

And the reason is: The Navy has many different accounts and yet we have a fairly finite budget and it is up to the Chief of Naval Operations to make recommendations to his Secretary to keep all of those programs in balance. Fighters have to be balanced with attack aircraft, and numbers of aircraft have to be balanced against ships, and the procurement accounts have to be balanced against the operating accounts. We have to make sure that all of those accounts are properly supported by the manpower account.

Then we have to support also the Marines because we provide them with their hardware.

FIGHTER REQUIREMENTS

So we have to maintain a balance. If we said, "Let's just take a fighter plane, the best fighter plane that money can buy and start buying it," we would find ourselves with only fighter planes, not only without attack airplanes, but maybe without destroyers, too.

We have to keep our requirements in mind, and we need to build a plane that is not only good enough to satisfy these requirements, but we have to have a combination of ships and aircraft that permit the Navy to do its job. That is what we face.

In looking at the fighter requirement, this is what we found. We will have only 18 squadrons of F–14's. We need more fighters. We have an A–7 that is going to need replacement in the middle 1980's. Why? Although it is a magnificent aircraft, the best light attack aircraft in the world today, our projections are that it simply cannot survive. Regardless of how many bombs it carries or how far it goes, it does not have battlefield survivability in terms of the agility in the battlefield we project for the middle 1980's.

And, third, the Commandant of the Marines has recently made the decision, as I am sure he will tell you, the F–14, because of its sophistication, is going to be very difficult for him to maintain under field conditions, and furthermore its capability is so high he does not really need all of that capability in his fighter and attack role.

So the Navy plan—already having 18 F–14 squadrons, which gives us a very good capability in the fleet air defense and the interceptor area—was to build roughly 400 F–18 fighter aircraft to supplement the F–14's, then to keep that production running and build 400 attack versions of the F–18 which will be used to replace the A–7. So we have taken advantage of one R. & D. cost to provide the Marines with their fighter, to provide a supplementary aircraft to the F–14 and to provide a follow-on for the A–7. We can't take those things, as I say, in isolation.

The alternative plan, as we pointed out, would have all F–14's in the VF squadrons. But that alternate plan, to my knowledge, neglects the research and development costs required to produce an aircraft that will have the performance to replace the A–7 10 years hence. We simply can't go out and put a bigger engine in the A–7 and, perhaps, streamline it a little bit. I think we will have to build a highly capable aircraft.

PROGRAM COMPARISONS

If you compare the two programs, it is my opinion that the Navy's program is much more cost effective. That is, the Navy's program will be more effective across the board; or, if you take a look at effectiveness, the alternate program will cost more. As a matter of fact, if you held the costs constant and tried to do the same job in the alternate program, it is my prediction you would run out of money before you could procure enough aircraft to fulfill the numbers required for our squadrons. That is my concern.

Now, I agree with you that we cannot buy an aircraft that won't do the job. That is why I was unalterably opposed to the F–16—because it was a plane that simply would not operate properly off of a carrier. I don't care if it cost $1 million apiece; it does not do any good to get something that has to be taken on and off a carrier with a crane. We must have an aircraft which will fit our needs, and we have that in the F–18.

Admiral Lee, who is a technical adviser to the Chief of Naval Operations and the Secretary of the Navy, has said, in his judgment, the F–18 represents, in its price class, the peak of aerospace engineering technology at this time. If we delayed and had another competition, he does not believe we would get an appreciably better aircraft in that price class.

CONSEQUENCE OF 2-YEAR DELAY

So let us look at what we would find if we delayed for 2 years. Looking at inflation and more R. & D. dollars going into this competition—and that is exactly what we would be doing—throwing away an investment we had and adding more money to go through the competition again. Therefore, to get the same aircraft, it would cost us more. If we decided not to spend any more money than we already had in the program, we would get a lesser aircraft.

The only way we are going to get a better aircraft 2 years from now is to spend considerably more money, because we are talking about the F–18 being in one price class and the F–14 being in another.

Now, I think from the point of view of the Chief of Naval Operations that the worst thing that will happen to us if we delay, is that for 2 years we are going to see a steadily declining number of fighters available in the fleet.

Now, this is just not a naval problem, because those fighters represent a national tactical air asset. When we look at what the Air Force has available in fighter aircraft and what the Navy has available, this is a capability that is going to be attenuated for the country although it will be largely effected in the Navy. Increasing the Air Force's capability in fighters, it is not going to help us because ours

are carrier-based fighters and will be available to operate off of aircraft carriers where no airfields are available.

So, to answer the question whether we agree with Mr. Spangenberg as to his evaluation of the relative capabilities of the F–4 versus the F–18 or the A–7 versus the F–18, I think on the cost side we ought to be able to give you a better answer.

I think in the question of the performance, cost versus effectiveness, we have to look beyond Mr. Spangenberg's testimony. As Secretary Potter has pointed out, he is one of the most respected in his community; but nevertheless you cannot adequately describe performance, particularly air-to-air combat performance, on a sheet of paper.

Now, we have with us today as a backup witness, should the committee care to call on him, Commander McKeown, who has flown the YF–17 and the F–16. He flew the F–4 in combat and he is available to answer any questions the committee might want to put to him.

Senator INOUYE. May I continue?

Chairman MCCLELLAN. Certainly.

Senator INOUYE. Admiral Houser, on the first 400, you indicated that the data that was provided by the contractor—was that the F–18 would be about $700 million more than the 14; is that correct?

Admiral HOUSER. Senator, I didn't understand that the contractor provided it. I thought you said the Navy provided it.

Senator INOUYE. The contractor noted the testimony.

Admiral HOUSER. If it is in the Navy testimony, it was correct at that time based on information we had.

Senator INOUYE. Now, for the second 400, the F–18 would cost $2.4 billion; is that correct?

Admiral HOUSER. Yes, sir.

Senator INOUYE. What would the cost of the 400 F–14's be?

Admiral HOUSER. They would not change. They would cost about $5 billion. Since we gave our testimony in May, there has been a forecast price increase on the F–14. This has been reflected in the selected acquisition report which comes to the Congress.

I think there is an important point to mention here, though: we do not need 800 more F–14's. We would not buy them in that quantity.

Senator INOUYE. I am talking just about comparable costs because it is supposed to be comparable to the 14.

Admiral HOUSER. The second 400 F–18's would be half of the second 400 F–14 cost. If you put the R. & D. burden on the first 400 F–18's the second 400 would be about half the cost of the second 400 of the F–14's.

ALTERNATIVES IF F–18 NOT BUILT

Senator PASTORE. If you did not build the F–18, what would have to be your course of action? What would you have to do? Let us assume the Congress stopped you from making the F–18. Where do you go from here? What do you do?

Dr. POTTER. Senator, there are two separate issues because the Navy has one problem and the Marine Corps has another. May I defer to Admiral Holloway for the naval response?

Senator PASTORE. Yes. Do we have to make more F–14's or have to approve the A–7? What do we have to do?

Admiral HOLLOWAY. Senator, first we have to decide whether or not we are going to permit our military capability to wither away to nothing. We could do nothing and simply see our capability decrease very rapidly. If we wanted to attempt to maintain our naval capability—that is, Navy and Marine Corps—we would have to keep our fighter squadron strength up. That means, in my view, we would have to buy more F–14's.

I believe we would then immediately have to initiate R. & D. for some new kind of aircraft, which would be either a replacement for the light attack aircraft, the A–7, or we would go back and recommend that we procure a VFAX—that is, an aircraft that can function as a fighter or a light attack aircraft.

I believe that the Commandant of the Marine Corps—and I would support him in this—would recommend we go for a combination fighter and light attack aircraft which is similar to what we have in the F–18 because he has fighter needs that must be fulfilled immediately.

Senator PASTORE. If you did that and you did improve by research your A–7's, wouldn't you more or less end up with something like the F–18 anyway?

Admiral HOLLOWAY. Yes, sir. My prediction is that it would be 2 years late and it would cost more.

Mr. CLEMENTS. Not only that, it would be 2 years late, which is going to cause problems within the force structure and it is going to cost more, and third, you are going to buy more F–14's than the Navy really wants in its force structure, which are, in turn, very high-cost maintenance airplanes; so you increase that part of it also.

This is what I meant a while ago. If we don't do this, they are going to come in with another airplane and we are going to have to go through the R. & D. process and it will just increase the cost. General Wilson has a little different problem.

DEGREE OF IMPROVEMENT FOLLOWING 2-YEAR DELAY

Chairman MCCLELLAN. Will you yield a moment, General, before you begin? While we're discussing a possible delay. I'd like to ask—would we have a better plane if we waited two more years? Do you think we could utilize better technologies, and so forth?

Mr. CLEMENTS. On both the Air Force and Navy side, when we are evaluating—and this is pertinent to what you asked me—the 16 and 18, or then 17, we asked that very question both ways—the Air Force and the Navy: If we delayed this question and went through more testing and more evaluation and more R. & D. could we come up in a year or two with a better airplane in a significant manner? They said: "Absolutely not."

I said: "What would be the technological gain?" They said: "Maybe 10 percent." That is the answer to your question.

Senator PASTORE. This is on the question of the improvements of the A–7. If you did not have the F–18 and you stuck with the F–14 and you knew that the A–7 would survive up to 1985, we wouldn't be here today talking about the F–18; isn't that true?

Admiral HOLLOWAY. I am not sure I got the drift of it.

Senator PASTORE. Let me do it again. If we could buy F–14's and we knew that the A–7 would endure without improvements up beyond

1985, that would be a different ball game entirely; wouldn't it? Isn't the real catch here: No matter what we do about the F–18, you have to improve the A–7 at some point?

Admiral HOLLOWAY. Yes.

Senator PASTORE. And by building the F–18, that improvement will become unnecessary?

Admiral HOLLOWAY. That is correct.

Chairman MCCLELLAN. General Wilson?

F–14 NOT SELECTED BY MARINE CORPS

General WILSON. Obviously the combat readiness of the entire Marine Corps is my responsibility and, when I became the Commandant on the 1st of July, it became quite obvious that an early decision was necessary for me on the F–14's. We were then programed to get four F–14 squadrons.

I looked at it carefully and I became convinced—although obviously, as has been indicated earlier, there are many vested interests that are pulling and tugging on both sides—I became convinced that the F–14 was not for the Marine Corps. It is too expensive and it takes one-third more people, 60 percent of whom are avionics personnel who have to be trained for 2 years and we would get only 2 years of service from these people on the 4-year enlistment and get only a 20-percent reenlistment rate of these individuals because they are in great demand in industry.

In addition to this, the logistics support requirements of the F–14 are tremendous—the additional costs related to this—and, as of the moment, the F–14 does not have an attack capability.

I decided to give the Navy those F–14 squadrons which were designated for the Marine Corps and take the F–18. The F–18 will have an attack capability with an electro-optical system and a laser capability which is required in a Marine Corps fighter attack aircraft.

Therefore, in response to your question, Senator Inouye, as to what we would do if the F–18 were disapproved; we would at the moment stay with the F–4 which we now have. The F–4N's will be reaching the end of their extended service life at a rate of about two squadrons each year after 1981. We would stay with the F–4 until another fighter attack aircraft could be developed. We do not have the A–7, by the way.

CONSEQUENCES OF ONE YEAR'S DELAY

Senator YOUNG. Could I ask one question here? Some say: Why can't you wait a year? What would be the harm in waiting a year?

General WILSON. We could wait a year and we will just continue to have problems because we have to have an improvement sometime, Senator Young. I think it has been clearly established—although I am not an aviator—clearly established that at some time we must have an improved fighter attack aircraft.

We do not have the A–7. We have the A–4 for our light attack aircraft. But we must have a fighter and we must have an attack aircraft; it is almost mandatory that we have a fighter with a dual capability in the Marine Corps. We need a replacement for the F–4 beginning in 1981 because the service life extension program runs out at that time.

Senator INOUYE. What if the Congress appropriated sufficient funds for the Department to carry on an F–18 engine program and called upon the Department to carry out further research and development and to come up with an aircraft that would be much better than the one you have today? Would that sort of delay your having it?

Mr. CLEMENTS. Will it cause what?

Senator INOUYE. Cause you havoc or problems?

Mr. CLEMENTS. It is going to cause problems but I don't like to think it is going to cause us havoc. Certainly any delay in a program in the way of 1 or 3 years——

Senator INOUYE. No delay in the engine.

Mr. CLEMENTS. I understand; it will be there. But as the program is now constituted, the engine development along with the airframe development and the avionics and so forth is all going to come out about even on certain milestones as we move forward in the critical path of the development.

Now, we will have thrown that out of phase if we go forward with the development in the airframe and these avionic packages and other aspects of it then are not brought along at the same time; so the program would be delayed, we will lose 1 year or 2 years and it will cause the Marine Corps a problem and the Navy a problem. And furthermore, Senator, it is going to cost more money.

Now, if I thought—and I am sure the Navy will concur in this; I have not posed the question but I am sure they would—if I thought we could get a significant improvement in the technological aspect by delaying this program and recomputing the whole thing, going back to industry and all, I would probably be in favor of doing it. But I don't believe we can and I don't think the Navy believes this, either. I just don't think it is possible.

Senator INOUYE. How did the Navy come out—at least in May 1975—that the cost of the 18 would be consonant with the 14?

Mr. CLEMENTS. That is about right.

Senator INOUYE. You never intended to fly 800 of the 14's?

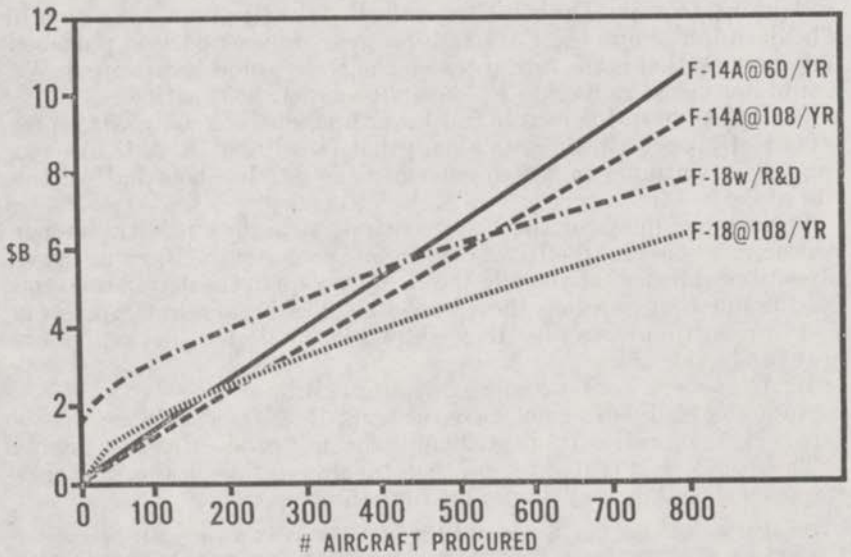
Mr. CLEMENTS. No; but that is not what they are saying. They are saying: With the program of 800 18's, the cost as a number is about half of the cost of 60 percent of the cost of the 14's.

Senator INOUYE. According to Admiral Houser it won't come out?

Admiral HOUSER. Senator, I don't recall that the Navy said that in May. I believe what was said in May of 1974 is that a goal was to be established to design an airplane which would cost about one-half as much as the F–14 and weigh about 30,000 pounds. That was the goal. We didn't quite make the goal. The airplane weighs about 33,000 pounds and it will cost approximately 60 to 65 percent as much as the F–14.

To clarify this matter of costs, you have to look at common production rates for the two airplanes. I have a number of figures if you would like to see them. I do not believe that in May 1975, we said the F–18 was going to cost that amount but I will check my records.

F-14/F-18 COST COMPARISONS
FY-75 $



EXPLANATION OF CHART

Mr. CLEMENTS. Senator, Grumman's own figures are $5.8 million as they analyze the F–18, to their $11 million for the F–14's. That is about a 60-percent factor, and those are Grumman's numbers at the same rate of production.

He has those crossover curves that he could put on the screen, which would help the discussion.

Senator INOUYE. The cost will be an essential element and it would assist me in making my decision.

Admiral HOUSER. All right, sir.

Senator Young, they are also on the back of my statement which you have a copy of as well as the viewgraph here.

Now, the third slide will get to this point which Senator Inouye brought up.

This is the clearest way that I could develop to explain the relative cost of the airplane. The solid line on top is the F–14 procured at 60 a year. That is about the rate we would buy them.

Senator INOUYE. I thought the most efficient rate was about 100 a year.

Admiral HOUSER. We had planned to buy them at the rate of six or eight per month. We, however, have already ordered 234. We would not build up to a maximum production rate for the remaining number of F–14's. These curves are for comparative purposes.

Senator INOUYE. Why are you buying this at two a month now? That is obviously inefficient.

Admiral HOUSER. We are building six a month at this time, Senator, that is, three for the Navy and three for Iran.

Mr. CLEMENTS. Let me answer the Senator on that. It is the lack of funds. If we had more money in our appropriations for that purpose we would be pleased to buy more airplanes. That is really your right answer.

Admiral HOUSER. The solid line is the F–14 at 60 a year, or 5 a month. The dash line shows the F–14 at 108 a year, for comparison purposes only because that is the rate at which the F–18 would be procured. We would not visualize buying F–14's at 108 a year at this time.

I call your attention next to this lower line, the broken line. It represents F–18 procurement costs alone; that is, without R. & D. As you can see, it continues to flatten out and it gets to be about half of the cost of the F–14.

These other lines for the F–14 continue straight out with further procurement because the R. & D. has been spent and the learning curve already established. If you add the R. & D. costs to the dotted line, you get the line that parallels the dotted line. The broken line represents F–18 production costs plus R. & D., while the dotted line represents only production costs.

Mr. CLEMENTS. Let me comment a minute, Bill.

Now, the 14 line does not have the sunk R. & D. costs in it; that is zero because it is already spent. That is the unit production cost factor.

The dash line is that way and then the dotted line on the 18 is that way, and what Admiral Houser has done, he says:

Yes; but we will put the R. & D. number in the broken line, actually because of the fact we will have to develop that attack airplane you were talking about a while ago; you ought to really discard the broken line in the evaluation of these numbers to make it a more simple comparison.

RATE OF PURCHASE FOR F–14 AND F–18

Senator INOUYE. What is the difference there now?

Admiral HOUSER. This is about the 425 aircraft I mentioned earlier as the crossover point. That is the rate we would plan to buy the F–14 compared to the rate at which we would buy the F–18. In the case of the F–18, we would be building fighters here and attack planes at the same time, at a rate of 108 a year.

Mr. CLEMENTS. You drop down to a zero base—if you do drop down to that on all three curves there, then it crosses the solid line at about the 200 mark?

Admiral HOUSER. Yes; about 200.

Senator INOUYE. You ought to include R. & D. cost?

R. & D. COSTS

Admiral HOUSER. The broken line includes R. & D. costs for the F–18. The solid and dash lines for the F–14 do not include R. & D. costs. However, R. & D. funds will have to be expended to develop another attack airplane if the F–18 is not developed.

Senator PASTORE. At that point, if you had to include the A–7, what would the R. & D. line look like? Would it still be the same?

Mr. CLEMENTS. It would be like that broken line.

Senator PASTORE. It would still be the same?

Mr. CLEMENTS. Yes.

Senator PASTORE. In other words, whether you throw in research and development on 18 or improvement on A–7, you will end up with the same cost more or less?

Admiral HOUSER. Yes, sir. I would like to say that we have not studied in detail the improvement to the A–7. One has been suggested as an interim improvement. It would extend its life for a several-year period but it would not be a true replacement. The cost for a true replacement would be on the order of this broken line.

I would like to be accurate when talking about improving the A–7 rather than replacing it. Improving it would cost somewhat less but would not be a long-term solution. At some later time it would still have to be replaced.

Mr. CLEMENTS. If we did that, Admiral Houser, the broken line, would probably go up or you would need both.

Senator PASTORE. Any further questions?

Senator YOUNG. No.

Senator PASTORE. Have you finished, Admiral?

Admiral HOLLOWAY. Yes, sir.

Senator PASTORE. Do we have a written statement from you?

Admiral HOLLOWAY. No, sir; I had no written statement. I had prepared to make remarks of that sense.

Senator PASTORE. You did very well.

Any further questions?

Mr. CLEMENTS. Senator Young, our desire is to pass to you and your committee here whatever information you need and we will give it to you just as factually and in depth as we possibly can. I certainly hope we have conveyed it. There is no effort on our part at all to withhold any kind of information.

Senator YOUNG. You have done a good job but the problem we have is answering questions that are raised like Mr. Spangenberg stated this afternoon. I imagine those same questions will be made on the floor. We have to rely on your testimony to answer those questions.

Senator PASTORE. Well, as I get it, he was talking as a technician, as a designer; that is all he had to explain; and I think Admiral Holloway admits it, but goes on to say we have to admit it, but have to measure it as to the need.

In this matter do you take the judgments of the man that has to apply and shoot from it.

PREPARED STATEMENT

We will insert Admiral Houser's prepared statement in the record at this point.

[The statement follows:]

Good morning, Mr. Chairman: I welcome this second appearance before you this year on the F–18 and hope that we will be able to answer your questions and also clear up some misunderstandings surrounding the F–18 program.

The conference report leading to the FY–75 Defense Appropriations Act included the following language: "The conferees support the need for a lower cost alternative fighter to complement the F–14A and replace F–4 and A–7 aircraft; however, the conferees direct that the development of this aircraft make maximum use of the Air Force Lightweight Fighter and Air Combat Fighter Technology and hardware." The conference report added that "Adaptation of the selected Air Force Air Combat Fighter to be capable of carrier operations is the prerequisite for use of the funds provided." This latter was reviewed by the General Accounting Office whose opinion was published favorable to the Navy on 1 October 1975.

Returning to the earlier stated language, the Navy responded by developing the F–18, an excellent naval aircraft, which is a lower cost alternative fighter to complement the F–14A and replace F–4 and A–7 aircraft. It makes maximum use of the Air Force Lightweight Fighter and Air Combat Fighter technology and hardware. The assignment given to the Navy was not an easy one. It was only through much work between the aircraft manufacturers and the Naval Air Systems Command that a suitable design was achieved.

There are some, Mr. Chairman, who believe that capability in new systems is all that matters and we should be prepared to spend whatever is necessary to achieve the maximum capability. It is an interesting position to take but hardly one in consonance with reality. We operate within well defined boundaries of funds for naval aviation. Our plans are a balance of aircraft, weapons, sensors, personnel and other factors. For every item that comes to you for funding many competing ideas have been reviewed and discarded as not being either affordable or as useful as others.

The foregoing is not in any way an apology for the very significant capabilities of the F–18. It has the agility, maneuverability and weapons to be an outstanding air fighter. It has the characteristics to serve as a superior fighter escort for a strike group. It also has a modern radar and all-weather missile which make it effective in the maritime air defense role at sea. It is not an F–14 replacement but rather, that which we set out to obtain, a lower cost alternative fighter to complement the F–14A. It is in the balance of types of aircraft as well as capabilities that we will achieve maximum effectiveness for the funds provided.

Turning now to costs, I call your attention to the first graph in your folder. This is a representation of budget accounts of the Navy. Note the generally level trend of numbers of dollars in the aircraft procurement account compared to all others which are ascending. The purchasing value of these dollars diminishes rapidly through the effects of inflation. Although there has been a reduction in the number of carriers from 17 in FY–72 to 13 at the end of FY–76, the percentage of reduction for carriers is less than that for other ships in the Navy. Through an intensive safety program, the equivalent of one year's procurement of tactical aircraft has been saved over the last five years as compared to earlier calculated losses. Nonetheless, the fact remains that we are procuring fewer airplanes because of the level of funding provided. One result is a major service life extension program as shown on this chart in which a large number of naval aircraft are operated for one and one-half to two times their original service life at a fraction of the cost for procurement of new equipment. It is these aircraft which are wearing out and must be replaced.

On the next chart you will see cost comparisons between the F–14 and F–18 measured in constant FY–75 dollars. The F–18 is substantially cheaper as it should be since it is a smaller aircraft. Even assuming the large R&D burden to place the aircraft into production, the F–18 is significantly less expensive to procure. This chart does not take into account the overall operating and support costs which are estimated for the F–18 to be less than two-thirds the cost for operating the F–14. This is shown in the next chart which compares annual operating and support costs for fighter and attack planes. Note that the operating costs for the attack version of the F–18 is slightly more than for the A–7, whereas in the case of the fighter it is substantially less than those of the F–14 or the F–4.

Life cycle costs are another measure of expenditures. These include development, procurement, and operating costs. This chart shows the comparison between a force composed of F–14s and a new light attack aircraft, alternative IA, and one composed of F–18/A–18s, alternative II.

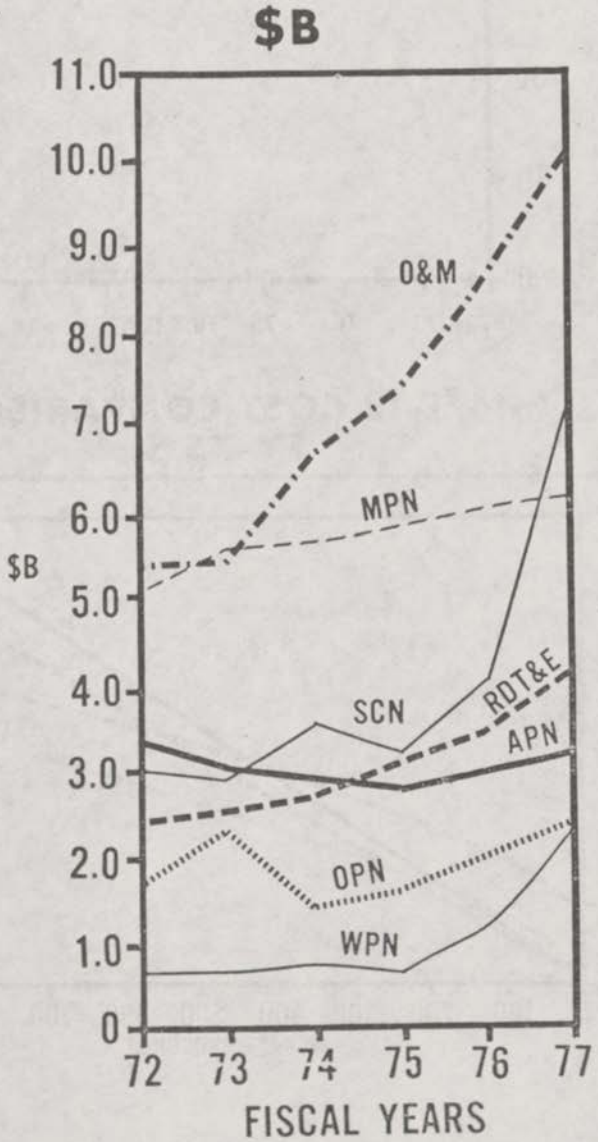
A comparison of capabilities is somewhat more difficult to describe but here again we believe we have achieved a lower cost alternative fighter to complement the F–14 in the fighter role. Both fighters can be employed in all fighter roles. The F–14 has an advantage in the maritime air superiority with a corresponding advantage going to the F–18 in close-in air fighting. Both aircraft can escort strike forces and can augment strike aircraft with air-to-ground ordnance. Thus, the F–18 complements the F–14. It has been alleged that the F–18 is inferior to the F–4. The Navy does not agree with this statement. The improved reliability of the F–18, its superior maneuverability, a more versatile radar, greater survivability features, and internal gun overcome the benefits of a larger missile load and two-man crew of the F–4.

A brief comparison of attack capabilities between the A–7 and the A–18 reveals that both aircraft can carry the required weapons and accurately deliver them at sea or ashore. It is in survivability that the A–7 will be found lacking

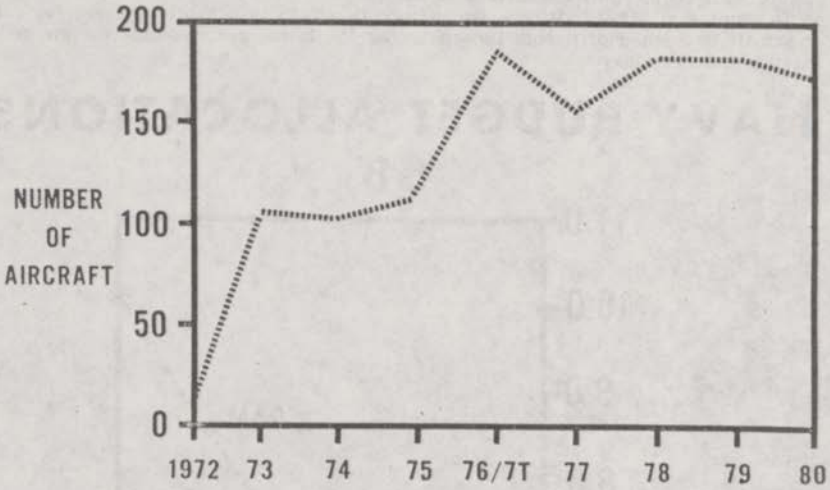
in the mid and late eighties. The superior agility and maneuverability of the A–18 will permit it to function effectively against both air- and ground-based defensive systems. It also can serve to augment the fighter force when additional fighters are required by the tactical situation.

In summary, Mr. Chairman, we believe the F–18 is a vital program for the Navy. It is a superior design incorporating the latest aerodynamic design, reliability and weaponry.

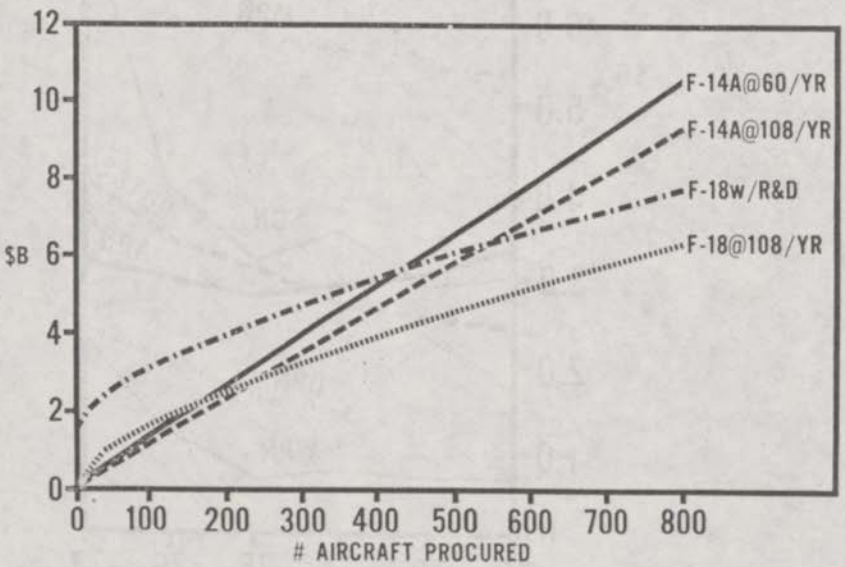
NAVY BUDGET ALLOCATIONS



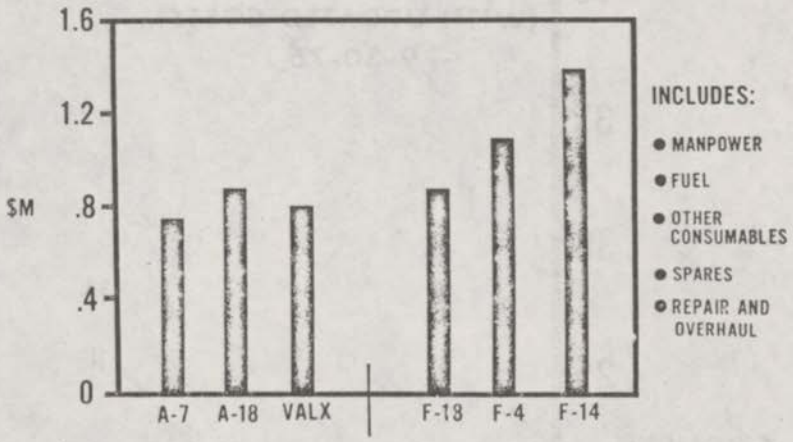
CONVERSION IN LIEU OF PRODUCTION



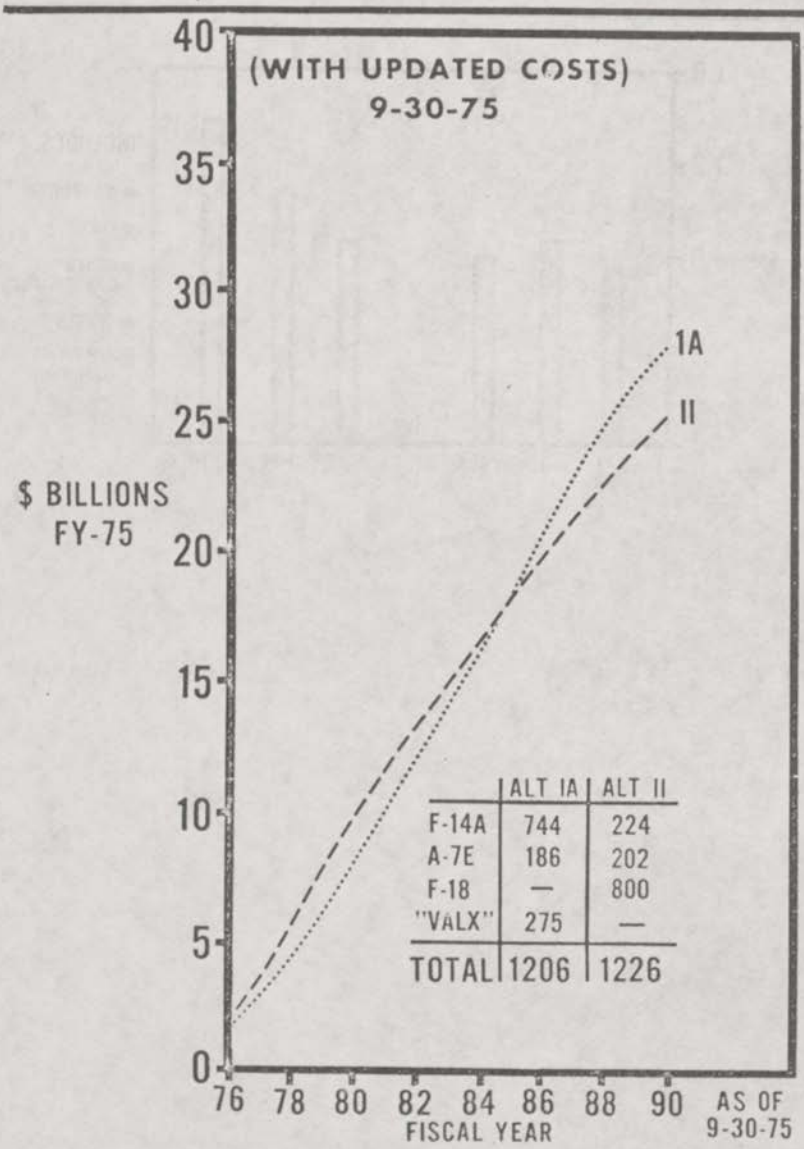
F-14/F-18 COST COMPARISONS FY-75 $



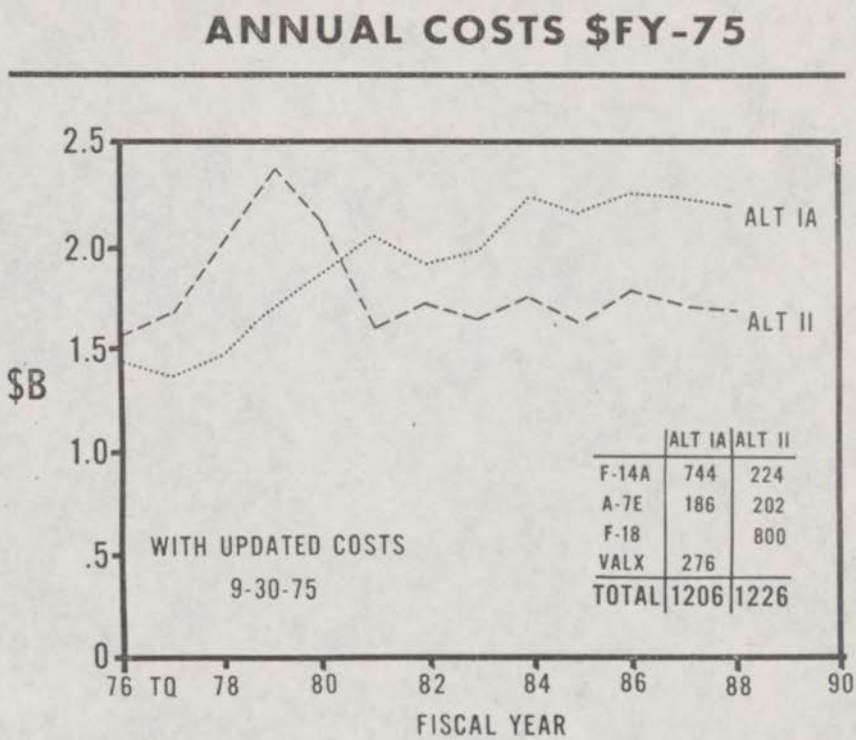
ANNUAL OPERATING & SUPPORT COSTS



CUMULATIVE COSTS
(R&D + PROCUREMENT + OPERATE & SUPPORT)



	ALT IA	ALT II
F-14A	744	224
A-7E	186	202
F-18	—	800
"VALX"	275	—
TOTAL	1206	1226



LIGHTWEIGHT FIGHTER PROTOTYPES

Admiral LEE. For the record, Mr. Chairman, earlier this afternoon Mr. Spangenberg mentioned the source selection of the lightweight fighter prototypes and mentioned rumors and allegations about how much it was changed and so forth. I happen to know that the source selection authority is in the room today and maybe you would like to hear his comments on the source selection for the lightweight fighter program earlier for the record to clear up what Mr. Spangenberg had to say.

DEPARTMENT OF THE AIR FORCE

STATEMENT OF LT. GEN. JAMES STEWART, COMMANDER, AERONAUTICAL SYSTEMS DIVISION, WRIGHT-PATTERSON AIR FORCE BASE, OHIO

SELECTION OF F–16 OVER F–17

Senator PASTORE. Go ahead. General Stewart, Air Force Systems Commander, the source selection authority for that program in 1975.

General STEWART. Yes, I was the selection authority for the prototypes and the Secretary of the Air Force then subsequently selected between the 16 and 17. There were six different designs submitted by our group: One single-engine design and one twin-engine design by General Dynamics, one design by Northrop, one by Boeing, one by LTV, and one by Lockheed. It was very clear in my evaluation that the General Dynamics' single-engine design and the Northrop design were the leading designs, with Boeing a close third. These were followed by LTV and then Lockheed.

After I completed my evaluation, I went to Washington and consulted with my chief and the Secretary. I presented my entire evaluation to them without naming my choice and asked them if they had any additional factors that I should consider, or if they had a different viewpoint on some of my evaluations. They did not, and my selection was the General Dynamics and the Northrop planes. We discussed the fact that Boeing was a close third.

Senator PASTORE. Any questions?

Mr. CLEMENTS. I think it would be also interesting for General Stewart to comment on any further selection for the Air Force and whether or not that was an independent choice when you chose the 16 versus the 17. I think that should also go in the record—the final choice.

General STEWART. All right, sir.

I was the chairman of the evaluation committee. I have either been the selector or chairman in the evaluation process for all of the new Air Force airplanes for the last 5½ years. The evaluation within the Air Force—and there was a consensus within the Air Force—was that the F–16 was the better buy for the Air Force for what the Air Force wanted to do. Then we had to consult with Secretary Schlesinger and Secretary Clements, because we had to look downstream. I would suspect an easier decision for the Department of Defense would have been possible had the Air Force selected the F–17, because we wouldn't have the great controversy we have now. But we selected on the basis of total cost to the Department of Defense and the needs of each service, and the F–16 was clearly the choice of the Air Force. I don't think necessarily the choice was shared outside the Air Force in toto.

Mr. CLEMENTS. That was the point I wanted to emphasize. It was not shared, and we knew nothing of that choice until he came to us with their choice.

QUESTIONS SUBMITTED BY SENATOR THURMOND

Senator PASTORE. Senator Thurmond has submitted questions to be answered for the record. Without objection, they will be inserted at this point.

[The questions and answers follow:]

NEED FOR ADDITIONAL FIGHTERS

Senator THURMOND. Why does Navy require another air combat fighter in addition to the F–14? Why would it not be better to continue expanding the F–14 inventory?

Answer. The Navy intends to use the F–18 to replace both F–4 and A–7 aircraft. All fighters of the Marine Corps and about one-fourth of those of the Navy will be F–18's. The F–18 is the Navy's response to providing a complementary fighter for the F–14A and replacement for F–4's and A–7's. It is more economical than the F–14 and has superior air fighting capabilities. A primary consideration is that it permits simplification of the Navy's tactical aircraft inventory.

F–14 INVENTORY REQUIREMENT

Senator THURMOND. What was the original inventory requirement for the F–14?

Answer. The original Navy requirement was for 469 F–14 aircraft for carriers. A full fighter force of 42 squadrons subsequently was planned, requiring 722 F–14's for the Navy and Marine Corps.

F–14: PRIMARY MISSION

Senator THURMOND. What is the primary mission of the F–14? If it is fleet air defense, primarily against incoming missile carriers, how will the F–18 complement the F–14 in that role?

Answer. Fighter missions of the Navy consist of fleet air defense, long-range fighter escort, and air combat against other fighters. The primary mission of the F–14 is fleet air defense and the F–18 can assist in this role by attacking aircraft which carry air-to-surface missiles. The F–18 also will complement the F–14 as a long-range escort fighter and in air-to-air combat.

COST OF ADDITIONAL F–14 PROCUREMENT

Senator THURMOND. What would the total cost in fiscal year 1975 dollars be to procure additional F–14 aircraft equivalent in effectiveness to 400 F–18's? Provide unit procurement costs and consider prior costs as sunk and not usable in the calculation. Use a production rate of eight per month.

Answer. The procurement unit cost of 400 F–14's at eight per month is about $12.6 million while the F–18 is about $9.9 million. However, the Navy would require F–14's at five per month rather than eight as in the case for the F–18. On the missions other than fleet air defense, effectiveness of both the F–14 and F–18 are adequate. As part of the 800 F–18 buy required for both fighter and attack missions, the procurement unit cost of the F–18 is about $7.9 million. Amortizing F–18 R. & D. costs over the 800 production aircraft results in a program unit cost of $9.6 million.

F–401 ENGINE

Senator THURMOND. If Navy had the option of buying more F–14's, would it require that those aircraft have the F–401 engine? If so, include the additional development cost required for the F–401 engine. (Note: Estimated additional development cost for the Pratt-Whitney F–401 is about $175 million.)

Answer. The Navy prefers the F–401 engine to give the F–14 additional thrust and maneuverability but the present engine and airframe provide the capability to accomplish F–14 missions. The estimated procurement unit cost of the F–14B at the required production rate is $14.5 million (1975 dollars), plus $175 million R. & D. costs for the F–401 engine.

F–18 Requirement

Senator Thurmond. What is the Navy's requirement for an aircraft with the F–18's performance characteristics? Where in the Navy mission spectrum would this aircraft be used?

Answer. The F–18 has been designed to perform several missions for the Navy and Marine Corps. Both services require the F–18 for use in the air-to-air role as well as the air-to-ground role. Speed and agility in the future will give pilots a much greater chance for survivability against more advanced enemy defense systems. The F–18 will be used as a fighter escort, bomber, flak suppressor, and several other missions that the tactical force commander finds necessary.

Fleet Operations Threat

Senator Thurmond. Does the Navy foresee a threat to fleet operations by enemy fighter aircraft?

Answer. Yes, the Navy anticipates a threat to fleet operations by enemy fighter aircraft. Anticipated are several types of fighter missions against the fleet; one is the threat of fighters to attack airplanes proceeding to targets; another is a major effort to deny freedom of the sea, by deploying bombers, fighters, anti-ship missiles, surface and subsurface strike; and, a third type of threat is the tactical aircraft strikes [deleted] using fighters as both escorts and bombers.

F–18: Lack of Growth Potential

Senator Thurmond. Would you comment on the lack of growth potential of the F–18?

Answer. The term "lack of growth potential" in the F–18 program comes from those who have not analyzed the carefully designed technology package of the F–18. The Naval Material Command and McDonnell Douglas engineers have devoted many hours to designs that incorporate available new technology. In addition, advance technology studies are being conducted which could provide growth capability in the F–18. Those studies include: modular radar, fiber optics, laser gyros, ECM advance warning systems, ISADC (interim standard airborne digital computer), and DIMAN (digital integrated multiplexed armament management). All of these new system developments will be compatible to the F–18 as potential growth items if required.

F–18/Carrier Landing Speed

Senator Thurmond. What would be its carrier landing speed and how does this compare with the F–4 or F–14?

Answer:

F–18	131–138 Kts
F–4	139–145 Kts
F–14	124–129 Kts

F–18/Air-to-Ground Capability

Senator Thurmond. Will the F–18 air-to-ground capability be as good as the A–7?

Answer. Yes, the F–18 air-to-ground capability is at least equivalent to the A–7.

F–18/All-Weather Capability

Senator Thurmond. Will the F–18 have a good all-weather capability?

Answer. The F–18 will have a good all-weather fighter capability and will have an all-weather attack capability comparable of the A–7.

F–18 Range

Senator Thurmond. What radius of action will the F–18 have in the escort role? How does that compare to the F–4 and the F–14?

Answer. The internal fuel fighter escort range of the F–18 is [deleted] NM, F–4 [deleted] NM, and the F–14 [deleted] NM. With external tanks, the F–18 can escort to [deleted] NM, the F–4 [deleted] NM and the F–14 [deleted] NM.

F–18 Suitability for Attack Role

Senator Thurmond. Since 400 of the proposed 800 F–18's are to be the attack version, or A–18, how do we know at this early stage this aircraft is suitable for the attack role? How was this evaluated during the source selection process?

Answer. During the prototype flying of the YF–17 (from which the F–18 is a direct derivative) there were specific tests accomplished to prove the bombing capability of the aircraft as well as missile and gun firing. All of the engineering and flight performance data has been used in determining that the F–18 would be an excellent attack aircraft.

The precise number of F–18 aircraft configured for attack missions depends on the requirements of the Navy as the future may dictate. That flexibility is an important factor in the F–18 program.

F–18/A–7 Cost Comparisons

Senator Thurmond. What are the cost comparisons of continuing to replace the A–7 force as required, versus procuring 400 A–18's?

Answer. Procurement unit cost of the F–18 in the attack configuration as part of the 800 program is $7.9 million in fiscal year 1975 dollars. If costs of just the last 400 F–18 aircraft are desired, the procurement unit cost would be $6.1 million. A–7 procurement unit costs would be $4.9 million; however, additional A–7 aircraft would not satisfy requirements beyond the mid 1980's.

F–14/F–18 Mix Advantage

Senator Thurmond. Give the advantages of an F–14/F–18 mix on carriers versus more F–14's and a new attack plane.

Answer. A new attack airplane other than the F–18 would require the same performance and capability as the F–18 and in the smaller numbers it would be procured, would have a higher average unit cost than that of the larger number of F–18/A–18's. The advantages of the mix of F–14/F–18 involves substantial savings in procurement, operating and support costs. Delay in development of a new aircraft will increase the cost of the attack aircraft in the Navy.

The mix of F–14/F–18 squadrons will give the force commander more flexibility than the F–14/new attack airplane mix because of the multimission capability of the F–18 for use as fighter escort, bomber, and flak suppressor.

F–14 Replacement of A–6

Senator Thurmond. When might the F–14 assume the A–6 role?

Answer. One option is to begin replacing the A–6 with a modified F–14 in the early 1980's.

Operational Readiness of Fighter

Senator Thurmond. As I understand it, the fighter version will be built first with the attack version mainly in the second 400 planes. Thus, when would the fighter enter the fleet in wing-size numbers, late or earlier?

Answer. The attack configured aircraft will follow along closely behind the fighter. The fighter will be operationally ready in late 1982 and the attack configuration in the mid-1980's.

F–18/A–7 Capability Comparison

Senator Thurmond. Do you have confidence at this time that the F–18 attack will be good enough in 1985 and through the 1990's when today it is about equal to the A–7, a plane which has been in the inventory a number of years?

Answer. The Navy has confidence that the F–18 will be superior to the A–7. The F–18 bombing accuracy is at least as good as that of the A–7 and with the additional thrust and agility it is evaluated substantially more survivable than the A–7 in the years past 1985. The Navy believes the F–18 with its advanced technology and capability of growth will satisfy fleet light attack needs through the 1990's.

Need for New Navy Attack Plane

Senator Thurmond. Does the Navy plan to deevlop another attack plane in the 1980's if the F–18 is approved? If it is not approved, then when would an attack plane be developed as a follow-on to the A7?

Answer. The Navy does not plan to develop another light attack plane but will be looking for a replacement for the medium all-weather attack A–6. If the F–18 program is disapproved, the Navy will require a new light attack aircraft no later than 1985 to replace the A–7.

F–18/A–7 Bomb Weight Capability

Senator Thurmond. Can the F–18 carry the same bomb load as the A–7 the same distance?

Answer. The F–18 cannot carry the same quantity of bombs but is capable of carrying more tonnage from the carrier when both aircraft have maximum internal fuel. The F–18 has about 5 to 15 percent shorter range than the A–7 with the design weapon configuration.

Marines Need for F–4 Replacement

Senator Thurmond. The Marines now state they do not wish to have F–14's. If the F–18 program does not materialize, then what aircraft would the Marines use to replace the aging F–4?

Answer. The Marine Corps currently expects to continue using the F–4 as long as possible for their fighter needs. If the F–18 program is not approved, the Marine Corps will be committed to the F–14 or a new development aircraft.

SUBCOMMITTEE RECESS

Senator Pastore. Thank you very much. The subcommittee will now recess, and will reconvene at the call of the Chair.

[Whereupon, at 5 p.m., Tuesday, October 21, the subcommittee was recessed, to reconvene at the call of the Chair.]

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