US AIRWAYS FLIGHT 1549 ACCIDENT

(111–10)

HEARING

BEFORE THE

SUBCOMMITTEE ON
AVIATION

OF THE

COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

FIRST SESSION

FEBRUARY 24, 2009

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U.S. House of Representatives
Committee on Transportation and Infrastructure
Washington, DC 20515

James L. Oberstar
Chairman

David Heymsfeld, Chief of Staff
Ward W. McCarragher, Chief Counsel

John L. Mica
Ranking Republican Member

James W. Coon II, Republican Chief of Staff

February 23, 2009

SUMMARY OF SUBJECT MATTER

TO: Members of the Subcommittee on Aviation

FROM: Subcommittee on Aviation Staff

SUBJECT: US Airways Flight 1549 Accident

PURPOSE OF HEARING

The Subcommittee will meet on Tuesday, February 24, 2009, at 10:00 a.m. in room 2167 Rayburn House Office Building to receive testimony on the US Airways Flight 1549 Accident.

Background

On January 15, 2009, US Airways Flight 1549 ditched[1] into the Hudson River at approximately 3:30 p.m. following a double-engine failure while en route to Charlotte Douglas International Airport. There were 150 passengers onboard the Airbus A-320 (N106US), in addition to the following five flight crew: Captain Chesley "Sully" B. Sullenberger III, First Officer Jeffrey Skiles, and flight attendants Sheila Dail, Doreen Welsh, and Donna Dent. Approximately 90 seconds after Flight 1549 departed LaGuardia International Airport ("LGA"), Captain Sullenberger reportedly experienced a double-bird strike on both CFM56-5B/P engines at approximately 2,700 feet above sea level,[2] causing loss of thrust and power in both engines.[3] During this time, Captain Sullenberger communicated with Air Traffic Control Specialist, Patrick Harten, at the New York TRACON LaGuardia Departure Facility regarding the status of Flight 1549.[4]

Captain Sullenberger reported that following the bird strike he took control of the aircraft from First Officer Skiles. Captain Sullenberger conferred with air traffic control ("ATC") to ascertain immediate landing sites. The first option contemplated was to return back to LGA; the second was to land at Teterboro Airport in New Jersey. Mr. Harten communicated with 14 entities,

[1] Ditching is a prepared emergency landing in water.
[2] Telephone conversation with NTSB officials (Feb. 17, 2009).
[3] *60 Minutes* (CBS television broadcast Feb. 8, 2009).
[4] FAA Memorandum from the New York Terminal Radar Approach Control Facility to the Aircraft Accident File (Feb. 2, 2009) (On file with author).

including other aircraft in the vicinity and controllers at other ATC facilities to hold aircraft and to assist Flight 1549 in landing.[5] Meanwhile, the pilots ran through their dual-engine failure checklist.[6] They attempted to restart the engines and regain power in the aircraft, but the engines did not restart.

When it became apparent that they would have to ditch the aircraft, Captain Sullenberger announced to the flight attendants and passengers that they should brace for impact. Passengers reported that after this announcement was made, the flight attendants began to shout instructions to passengers in unison – "heads down, stay down." The pilots then landed the aircraft smoothly in the Hudson River. From there, reports from passengers and crew indicate that the evacuation was fairly orderly. Passengers filed out onto the aircraft wings and into the raft slides on both the right and left front of the aircraft. Within minutes after the water landing, ferry boats, police boats, and the U.S. Coast Guard rescued all 155 people. Four were injured, including Flight Attendant Welsh.

The National Transportation Safety Board ("NTSB") responded to investigate the accident scene, and its investigation is ongoing. On February 4, 2009, the NTSB announced that organic samples were recovered from the engines and were sent to the U.S. Department of Agriculture ("USDA") for a DNA analysis to gain information about the bird(s) species.[7] One feather was recovered from a wing and was sent to the Smithsonian Institution's National Museum of Natural History for bird identification, and was recently confirmed to be a Canada Goose.[8]

I. Pilot and Crew Procedures for Emergency Landings

Pilots and flight attendants have specific responsibilities when preparing an airplane and passengers for an emergency landing. In the cockpit, pilots communicate with ATC and attempt to land the airplane safely. The level of communication between the pilots and the flight attendants varies depending on the complexity of the situation and the workload level in the cockpit. If a crash is imminent, the pilot notifies the flight attendants so that they can ensure that able-bodied passengers are seated in the exit rows. (If there is not enough time to notify the flight attendants separately, the pilot may make an announcement to the entire cabin, as was the case with Flight 1549.) As the landing nears, flight attendants shout instructions to passengers in unison. Following landing, flight attendants assist in opening exits and evacuating passengers onto raft slides, and pilots also assist in evacuation.

In a crash, passengers must be evacuated within 90 seconds since a post-crash fuel-fed fire can quickly engulf an aircraft. An important component of an aircraft's airworthiness certification is that each air carrier must be able to show that "each type and model of airplane with a seating capacity of more than 44 passengers . . . allows the evacuation of the full capacity, including crewmembers, in 90 seconds or less."[9] This must be demonstrated with only one half of the

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[5] Ibid.

[6] These checklists differ by airline and plane type. The airplane manufacturer submits a suggested dual-engine failure checklist to the airline. The airline compiles a checklist that it wants to adopt and submits it to FAA for approval.

[7] NTSB, Advisory: Third Update on Investigation into Ditching of US Airways Jetliner into the Hudson River (Feb. 4, 2009).

[8] NTSB, Advisory: Fourth Update on Investigation into Ditching of US Airways Jetliner into the Hudson River (Feb. 12, 2009).

[9] 14 C.F.R. § 121.291(a) (2008).

emergency exits.[10] According to the FAA, the A-320 was certified for ditching. If aircraft certification with ditching procedures is requested, the requirement for evacuation is that the manufacturer must show, "under reasonable probable water conditions, the flotation time and trim of the airplane will allow the occupants to leave the airplane and enter the liferafts."[11]

II. Crew Training

Commercial pilots and flight crew undergo many different kinds of training that are governed by federal regulations, Federal Aviation Administration ("FAA") advisory notices, and U.S. airline policies. Pilots' and flight attendants' training, as provided by air carriers, includes indoctrination, initial, transition, recurrent (every 12 months), and emergency. Every 24 months, crewmembers all must go through recurrent, emergency hands-on training. This training must provide instruction in emergency assignments and procedures; location, function and operation of emergency equipment – including equipment used in ditching, fire extinguishers, emergency exits, etc; and instruction on handling emergency situations. Recurrent training includes: cockpit preparation and procedures; crew coordination; passenger briefing and cabin preparation; donning and inflation of life preservers; use of life-lines; and boarding passengers and crew into a raft or slide.[12] Pilots and flight attendants are not required to undergo a ditching simulation. In addition to the training that airlines are required to provide, the Civil Aerospace Medical Institute ("CAMI") offers a 1-day physiology training course for U.S. civil aviation pilots and flight crews that covers psychological flight stresses, training for flight conditions in emergency situations, and physical effects of air travel in varying challenging situations.[13]

FAA also requires pilots and flight attendants to undergo Crew Resource Management ("CRM") training. CRM focuses on improving communications between the pilots and crew, while taking into account human factors, hardware, and information. CRM also focuses on "situation awareness, communication skills, teamwork, task allocation, and decisionmaking within a comprehensive framework of standard operating procedures" with the goal of preventing accidents and dealing with stressful situations by improving performance through enhanced coordination.[14] Air carriers are required to provide CRM training. Joint flight attendant and pilot training for CRM is not required by regulation, but FAA reports that many airlines have been practicing it for many years. Joint training is useful for gaining mutual understanding of the issues that affect different groups and the specialized training that each receives. CRM exercises are also useful in reconciling incompatible training practices.[15]

On January 12, 2009, FAA issued a Notice of Proposed Rulemaking ("NPRM") to overhaul specific crew training requirements. The primary purpose of the NPRM is to establish new requirements for traditional air carrier training programs to ensure that safety-critical training is included. The rulemaking is part of the FAA's efforts to reduce fatal accidents in which human error was a major contributing cause. Some of the training requirements proposed are to require: training and evaluating flight crewmembers in a complete flight crew environment; the use of flight

[10] 14 C.F.R. § 121 Appendix D (2008).
[11] 14 C.F.R. § 25.801 (2008).
[12] 14 C.F.R. § 121.417 (2008).
[13] FAA, Airman Education Programs (May 6, 2008), http://www.faa.gov/pilots/training/airman_education/aerospace_physiology/.
[14] DOT/FAA, Crew Resource Management Training, AC 120-51E (Jan. 22, 2004).
[15] Ibid.

simulation training devices ("FSTD") for training, testing, and checking flight crewmembers; additional training and practice in the use of CRM principles; training in an FSTD with a complete flight crew; flight attendants to complete "hands on" performance drills using emergency equipment and procedures every 12 months; flight attendants to complete operating experience by aircraft type; and trained and qualified flight attendant ground instructors and evaluators.[16] According to the proposal, FSTD will allow for more in-depth training in a safer environment. FSTD have become a widely-used tool to simulate real life situations that may not have otherwise been possible and to optimize human performance and reduce human error.[17] FSTD are not often used to simulate ditching situations. The NPRM's training enhancements include academic training, known as "ground training" and job performance training, known as "flight training".

III. Crash Survivability

U.S. airline fatalities have fallen, and crash survival rates have increased as safety has improved.[18] According to aerospace researchers, "[t]he most important factor affecting the survivability of an aircraft accident is the evacuation efficiency of the passengers and crew on board."[19] According to the NTSB, "[s]urviving an accident is the result of many factors," including "cabin structural integrity, seat belts, seat design, child restraint systems, and brace positions." CAMI conducts research on many aviation issues, including crash survivability, the best evacuation patterns, the best size of exit rows, and seat cushion design and techniques for use. The FAA William J. Hughes Technical Center has conducted research into crashworthiness, active vibration control, and fire protection.

Research and NTSB recommendations have led to airplanes designed to be more resilient to disasters. According to the NTSB, the following airplane design features can all assist in allowing passengers to escape after an accident: "fire retardancy, exit design, aircraft configuration, and evacuation procedures."[20] Other improvements in design contributing to survivability are: "fire detection and suppression systems in lavatories and cargo compartments, modifications in cargo compartments to delay fires from spreading, and fire blocking of cabin and seat materials that also prevent fires from spreading, . . . floor level escape lighting systems, heat resistant slides, . . . and improvements for the crashworthiness of passenger seats."[21] The NTSB also notes that passenger education, such as preflight briefings and safety cards, plays a large role in increasing occupant survival. Additionally, as a result of psychological research, flight attendants are trained to shout orders to passengers repeatedly in unison so that passengers understand what to do.

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[16] Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers, 74 Fed. Reg. 1280 (proposed Jan.12, 2009) (to be codified at 14 C.F.R. pts. 65, 119, 121 et al.).
[17] Ibid.
[18] Bureau of Transportation Statistics, Annual Report (2007).
[19] Z. Xue, & C.L. Bloebaum, A Particle Swarm Optimization-Based Aircraft Evacuation Simulation Model – *Vacate Air*, American Institute of Aeronautics and Astronautics, at 1 (Jan. 7-10, 2008).
[20] NTSB, Safety Report: Survivability of Accidents Involving Part 121 U.S. Air Carrier Operations, PB2001-917001, at 19 (Feb. 21, 2001).
[21] Ibid.

IV. Bird Strikes

As aircraft traffic has increased, so too have wildlife "strikes," or collisions. Populations of many large bird species have also increased. There were 82,057 reported bird strikes from 1990-2007, with 7,439 in 2007 alone.[22] According to the U.S. Department of Agriculture's Wildlife Services ("USDA/WS"), "[w]ildlife strikes cause more than 550,000 hours of aircraft downtime and cost U.S. civil aviation in excess of $500 million every year." Approximately 97 percent of wildlife strikes are bird strikes.[23] Historical data illustrates that most bird strikes (62 percent) occur during the day and most (60 percent) occur during the landing, approach, or landing roll phase of flight. FAA collects bird strike data primarily from voluntary reports submitted by airline operators, pilots, tower operators, and airport operators and personnel.[24] Most bird strikes also occur fairly close to the ground. Sixty percent of bird strikes occurred at 100 feet or less above ground level ("AGL"), 73 percent at 500 feet or less AGL, and 92 percent at 3,000 feet or less AGL.

ATC is required to report unsafe runway or airport conditions to airport personnel. Controllers issue advisories from information obtained from pilot- or controller-reported, or radar-observed bird activity. Controllers must also report information to flight service stations when the wildlife could affect safety. Likewise, pilots are encouraged to report unsafe conditions to ATC.

Engine Design and Testing. Commercial air carriers are replacing older aircraft with newer airplanes that have more technologically advanced engines. The engine bird ingestion requirements (e.g., bird size and numbers) vary based on the size of the engine inlet. When ingesting bird(s) of a particular size and weight as set forth by the regulations, the engine should be designed to prevent a "hazardous engine effect," such as significant power loss or the inability to shut the engine down.[25]

Airport Bird Mitigation Strategies. Wildlife is attracted to airports when a desirable habitat is present, including available food, water, shelter, and nesting areas. USDA/WS offers consultation and management assistance to airports to assess wildlife problems, improve safety, and reduce wildlife hazards. FAA also has a staff biologist.

Under FAA regulations for airport certification and operation, airports must conduct wildlife hazard assessments when there is a multiple-wildlife strike, engine wildlife ingestion, or substantial damage to an aircraft from striking wildlife.[26] The assessment must be completed by a wildlife damage management biologist. The USDA/WS reports that it has over 300 such biologists that assist airports with assessments and mitigation plans.[27] Once the assessment is completed, the airport is required to submit a mitigation plan to the FAA Administrator for approval and determination of the need for a wildlife hazard management plan by looking at a variety of factors, such as airport size and activity and the breadth of the wildlife problem. If the Administrator

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[22] Only about 20 percent of strikes involving civil aircraft are reported and only about 44 percent of reported strikes identify the wildlife species group responsible.
[23] USDA/WS, Strike One—You're Out! Wildlife Services Helps Reduce Wildlife Conflicts at Airports (Aug. 2006).
[24] DOT/FAA and USDA/WS, Wildlife Strikes to Civil Aircraft in the United States 1990-2007, at 16 (June 2008).
[25] 14 C.F.R. § 33.75-6 (2008). Manufacturers report that in engine testing, they use dead birds (that are humanely killed), which are typically obtained through federal agencies or commercial sources. The regulations do allow engine manufacturers to use substitute objects, such as a gelatin bird, which mimic the size, weight, and density of a real bird. The bird(s) are shot through devices into the engine at the most critical velocity, engine speed, and location.
[26] 14 C.F.R. § 139.337 (2008).
[27] USDA/WS, phone conversation (Feb. 17, 2009).

determines that a mitigation plan is needed, the airport will develop such a plan, and submit it back to the Administrator for approval before it can begin implementation. The airport will then include the plan in its Airport Certification Manual.

Plans have to take into account varying complexities of federal, state, and local government statutes and policies. For example, the U.S. Fish and Wildlife Service ("USFWS") is responsible for conservation of migratory bird populations, and threatened and endangered species. USFWS renders opinions on proposed activities that might impact these populations and habitats. The U.S. Environmental Protection Agency ("EPA"), state EPAs, local governments and zoning boards are responsible for landfill permitting.[28] Migratory birds are protected by federal law, including their nests and eggs, so doing anything to affect those populations would have to be permitted through USFWS. A key to successful mitigation is understanding the various bird populations. Examples of mitigation strategies and factors that an airport takes into account when developing bird mitigation plans are: waste disposal facility coordination; protection of approach or departure airspace (5 miles is recommended); eliminating accessible above-ground water sources; aircraft flight schedule modification; habitat modification and exclusion techniques to make the area uninviting or inaccessible; repellent and harassment techniques, like pyrotechnics, runway sweeps, chemical repellants, radio-controlled model aircraft; wildlife removal; use of nonlethal projectiles; and trapping or destroying eggs and nests.[29]

Since fiscal year 2007, FAA has funded $2.5 million per year for research on wildlife hazard mitigation. FAA's Airport Improvement Program can be used for capital improvements to reduce wildlife hazards if the actions are designed to produce long-term solutions. Capital improvements include habitat modification and the purchase of bird hazard reduction equipment.

Bird Radar Detection. Radar detection devices have been in development for many years. The concept for a radar device is that it scans the runway and above ground level to detect birds, that information is sent to ATC, which then provides automated monitoring and alerting to the controller. The radar devices would be placed at the ends of major runways. Another component of the system would show ATC the risk in the runway vicinity taking into account many factors, like environmental changes, and the size of the bird(s) in the area. The U.S. Air Force uses radar detection at some bases, and National Aeronautics and Space Administration is currently using bird radar technologies for space shuttle launches. One manufacturer of such technology estimates that an airport can purchase its entire radar system for between $500,000 and $1.5 million. FAA is evaluating experimental bird radars at Chicago O'Hare, Dallas/Fort Worth, and Seattle-Tacoma airports under its Airport Technology Research Program. FAA asserts that more testing is required to ensure that the radar is operationally effective. Some companies dispute that and say that the technology is ready.

[28] E. C. Cleary & R. A. Dolbeer, Wildlife Hazard Management at Airports: A Manual for Airport Personnel (July 2005).
[29] Ibid.

WITNESSES

PANEL I

Captain Chesley B. Sullenberger, III
US Airways, Inc.

First Officer Jeffrey B. Skiles
US Airways, Inc.

Flight Attendant Sheila Dail
US Airways, Inc.

Flight Attendant Donna Dent
US Airways, Inc.

Flight Attendant Doreen Welsh
US Airways, Inc.

Mr. Patrick F. Harten
Air Traffic Control Specialist
New York Terminal Radar Approach Control

PANEL II

The Honorable Robert L. Sumwalt, III
Member
National Transportation Safety Board
Accompanied by:
Mr. Tom Haueter
Director, Office of Aviation Safety
National Transportation Safety Board

Ms. Margaret Gilligan
Associate Administrator for Aviation Safety
Federal Aviation Administration

Captain John Carey
Chairman, Accident and Investigation Committee
US Airline Pilots Association (USAPA)

Ms. Candace K. Kolander
Coordinator, Air Safety, Health and Security
Association of Flight Attendants-CWA, AFL-CIO

Captain John Prater
President
Air Line Pilots Association, International

Mr. Mark Reis
Managing Director
Seattle-Tacoma International Airport
Board Member, Airports Council International-North America

Mr. John E. Ostrom
Chairman, Bird Strike Committee-USA
Manager, Airside Operations
Minneapolis-St. Paul International Airport
Accompanied by:
Dr. Richard Dolbeer
Chairman (1997-2008)
Bird Strike Committee-USA

111TH CONGRESS
1ST SESSION

H. RES. 84

Honoring the heroic actions of the pilot, crew, and rescuers of US Airways Flight 1549.

IN THE HOUSE OF REPRESENTATIVES

JANUARY 26, 2009

Mr. CROWLEY (for himself, Mr. NADLER of New York, Mr. MCMAHON, Mr. MCNERNEY, Mr. ACKERMAN, Mr. HIGGINS, Mr. MCHUGH, Mr. HINCHEY, Mr. HALL of New York, Mr. ISRAEL, Mr. TONKO, Mr. ARCURI, Mr. RANGEL, Mrs. MCCARTHY of New York, Mr. ENGEL, Mr. LEE of New York, Mr. WEINER, Mrs. MALONEY, Mr. BISHOP of New York, Ms. CLARKE, Mr. TOWNS, Mr. SERRANO, Mr. KING of New York, Mr. ROTHMAN of New Jersey, Mr. SIRES, Ms. BORDALLO, Mr. PETRI, Mr. BRADY of Pennsylvania, and Mr. COSTELLO) submitted the following resolution; which was referred to the Committee on Transportation and Infrastructure

JANUARY 26, 2009

The Committee on Transportation and Infrastructure discharged; considered and agreed to

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RESOLUTION

Honoring the heroic actions of the pilot, crew, and rescuers of US Airways Flight 1549.

Whereas US Airways Flight 1549 took off from LaGuardia Airport in Queens, New York, on January 15, 2009, bound for Charlotte, North Carolina, and lost engine power shortly after takeoff;

Whereas Captain Chesley B. Sullenberger III and First Officer Jeffrey B. Skiles recognized the need to land the plane quickly and sought out the Hudson River as the best option to avoid populated areas;

Whereas Sullenberger and Skiles displayed quick thinking and skillful control of the aircraft, setting the plane down in a controlled landing in the water;

Whereas flight attendants Sheila Dail, Doreen Welsh, and Donna Dent of Flight 1549 reacted swiftly to prepare passengers for impact in a minimal amount of time;

Whereas local ferry boats, official police boats, and U.S. Coast Guard crafts were able to reach the airliner quickly and rescue the passengers and crew from the near-freezing water;

Whereas Dail, Welsh, and Dent evacuated all 150 passengers onto the awaiting U.S. Coast Guard, ferry boats, and official police boats within minutes;

Whereas even as the plane began sinking in the Hudson River, Sullenberger remained in the plane surveying the aisle twice to make sure all passengers had gotten out safely before he exited the aircraft; and

Whereas due to the heroic efforts of the flight crew of Flight 1549, and the rescue boats, all 155 passengers and crew survived, without serious injury: Now, therefore, be it

Resolved, That the House of Representatives—

(1) applauds the skill, quick thinking, and bravery of Captain Chesley B. Sullenberger III and First Officer Jeffrey B. Skiles;

(2) commends the quick response by the flight attendants Doreen Welsh, Donna Dent, and Sheila Dail of Flight 1549 to prepare passengers for impact and rapid evacuation; and

(3) praises the quick response from the boats, first responders, and private citizens that arrived at the scene to aid and rescue passengers.

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HEARING ON US AIRWAYS FLIGHT 1549 ACCIDENT

Tuesday, February 24, 2009

HOUSE OF REPRESENTATIVES,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
SUBCOMMITTEE ON AVIATION,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:02 a.m., in Room 2167, Rayburn House Office Building, Hon. Jerry F. Costello [Chairman of the Subcommittee] presiding.

Mr. COSTELLO. The Subcommittee will come to order. The Chair will ask all Members, staff, and everyone to turn all electronic devices off or on vibrate. The Subcommittee is meeting today to hear testimony on the US Airways Flight 1549 accident.

Let me mention that the three flight attendants just left a meeting in my office, and they were delayed in the hall by Congresswoman Foxx. She is meeting with them briefly. They should be here momentarily.

We will go ahead and proceed. I would expect that they will be here by the time that I finish my opening statement and the Ranking Member, Mr. Petri, does as well.

I intend to give a brief opening statement, then I will recognize the Ranking Member, Mr. Petri, for his opening statement, and recognize other Members. We would encourage Members to insert their statements in the record; and let all of our witnesses know that their entire statement will be inserted in the record as well.

I just explained to everyone here why you were a little bit late, that you were meeting with myself and Congresswoman Foxx. Please be seated.

I welcome everyone to the Aviation Subcommittee hearing today on US Airways Flight 1549. I want to thank our witnesses for being here today, especially the flight crew, the pilots, the flight attendants, and the air traffic control specialist that brought US Airways Flight 1549 down safely on the Hudson River. I know my colleagues will join me and Mr. Petri in giving them a round of applause for doing an outstanding job in saving the lives of so many people.

As everyone knows by now, on January 15, 2009, US Airways Flight 1549 was departing LaGuardia Airport for Charlotte, North Carolina, and within minutes, lost engine power. Captain Chesley Sullenberger, III and First Officer Jeffrey Skiles realized the seriousness of the situation, and immediately sought a safe place to land.

The Hudson River was their only option; and these two pilots, as well as Flight Attendants Sheila Dail, Doreen Welsh, and Donna Dent worked together to prepare the 150 passengers for the emergency landing. The crew did an excellent job on the controlled landing in the Hudson River.

This incident demonstrates the importance of training and preparation, showcases the skill of our aviation workforce, and reinforces the importance of consistent vigilance and oversight of aviation safety.

I would be remiss if I did not mention that just a few short weeks ago, after this incident, the entire Nation mourns the loss of Colgan Air Flight 3407, the crew and their passengers. Fifty people died as a result of that crash. Information is still being gathered, and an investigation is under way to determine the cause of that crash.

The United States has the safest air transportation system in the world. In 2007, there was only one fatal accident in 10.9 million U.S. airline departures. However, we must not become complacent about our past success.

These recent accidents once again place aviation safety in the spotlight. It is the responsibility of this Subcommittee to ensure that the Federal Aviation Administration is fulfilling its duties to provide effective oversight of every aspect of the aviation system; and I am interested in hearing today from the FAA and the NTSB board on these issues.

This situation also highlights the association between training, workforce development, and aviation safety. The current economy has the entire workforce being asked to do more with less, including work longer hours. To that point, we must make certain that fatigue does not become an issue, as it creates risks to the safety of the air traffic system.

Finally, even though the bird strikes that caused US Airways Flight 1549 to lose both engines and land in the Hudson River has brought greater attention to the issue, the danger presented by avian life is not new. The Seattle-Tacoma International Airport, in conjunction with the University of Illinois in my home State, is using an enhanced radar system to better deal with bird detection. O'Hare, JFK, and Dallas/Fort Worth International Airports are all slated to receive similar radar systems this year. I am interested in hearing more about this technology from Mr. Mark Reis on the second panel.

Again, I thank the flight crew, the air traffic control specialist for being here today. I commend all of you for a job well done, and look toward to your firsthand account of the January 15, 2009 accident, and what we can learn from the incident for the future.

Before I recognize Mr. Petri for his opening statement, I ask unanimous consent to allow 2 weeks for all Members to revise and extend their remarks, and to permit the submission of additional statements and material by Members and witnesses. Without objection, so ordered.

At this time the Chair recognizes the Ranking Member of the Subcommittee, Mr. Petri.

Mr. PETRI. Thank you very much. Good morning and welcome to this hearing this morning.

It seems that we in Congress routinely, or at least regularly, call up Federal officials, industry representatives, and others in order to lambaste and criticize for some deficiency or another. After all, that at least is part of our job in providing oversight. I think it is also important that we stop and take a moment to recognize when things actually do go right.

On January 15th, a lot went right in the middle of a horrifying situation; and I think we owe those involved to say, ″Job well done.″ At the same time, as we hear their experiences, we can learn some important lessons for the future.

As Captain Sullenberger has repeatedly pointed out, the positive outcome of Flight 1549 was a team effort from those in the air, on the ground, and on the water. I would be remiss if I did not acknowledge the courageous actions of the flight crew, air traffic controllers, rescue teams, and the passengers themselves. Their professionalism, bravery, and calm under pressure prevented a catastrophe. And for that, we thank them all.

So what have we learned so far from the events of January 15th? Clearly, training played a central role. Without proper training, even the most advanced avionic equipment is of no value. The fact that Flight 1549 was able to make an emergency landing and quickly evacuate—in a river, no less—without any serious injury, proves the effectiveness of pilot and crew training programs. The assistance provided by air traffic controllers and quick response by rescue teams are also indicative of the importance of quality training. So many of them have said that when confronted with the situation their training simply kicked in and they knew exactly what to do.

Let's not forget other factors that contributed to this positive outcome. High certification standards ensured the plane's survivability after the bird strike, double engine failure, and controlled ditching into the Hudson River. Even more, they allowed the plane to stay afloat as passengers and crew were evacuated and rescued. These standards are established to improve safety and enhance aircraft survivability; and in this case, they saved lives. Procedures were followed, standards were met, training was applied, and rescue was immediate. It was, all things considered, a good day for those aboard Flight 1549 and, thankfully, a learning experience for the aviation community.

Despite the success, we must continue to promote the best possible training and the highest equipment standards. Let's also thoroughly analyze the cause of the accident, which appears to be bird strikes, and seek ways to mitigate them in the future. Dedication to safety has made our aviation system the safest in the world, and we need to continue to work to keep it that way.

Again, I would like to thank the Chairman for calling this hearing and our witnesses for taking the time to join us today. I look forward to your testimony, and yield back the balance of my time.

Mr. COSTELLO. The Chair thanks the Ranking Member.

And again I would encourage Members to submit statements in the record. But if any Member would like to be recognized at this time, I think the Chair would recognize Mr. Hall from New York.

Mr. HALL. Thank you, Mr. Chairman. And my congratulations and praise to our panel members, who, I think, inspired this country with your actions as well as providing a great deal of relief.

I have sailed that stretch of the Hudson River many times in my own different vessels over the years; and if I had been told that a commercial airliner could safely land in a busy river—the Hudson River especially—in that temperature, and everyone had survived, I would have thought that it was a daydream or it was somebody's imagination.

But you made it come true. Everything had to go right, and everything did, thanks to your training and execution.

All of us in Congress—most of us in Congress fly every week in and out of Washington, DC, and so I am quite familiar with the instructions that the crew give to passengers in the event of a water landing, et cetera, et cetera. In the words of the late George Carlin, most of us think of that as ″Put your head between your legs, and dot-dot-dot″—you know the rest.

But I think obviously you and the first responders and the captains of the vessels that came out to meet the plane and to rescue you and your passengers, everybody did a very difficult job very well, and the training definitely paid off. There was heroism and bravery as well as skill.

Captain Sullenberger, First Officer Skiles, Flight Attendants Dail, Welsh, and Dent, when you rescued your 150 passengers, you rescued a number of my constituents from the Hudson Valley, and I thank you for them and their families.

And Controller Harten, one of the little-known voices who enable our airways to be as safe as they are through constant communication with every plane in the air, as a New Yorker I was proud of the actions of all of the people involved; and want to thank you on behalf of my constituents and New Yorkers in general.

I look forward to hearing your testimony, and considering the serious issues regarding air travel and the dangers of bird strikes, what possible remediation or changes can be made to lessen the dangers from them. And once again, thank you for being here.

And thank you, Mr. Chairman, for the opportunity to speak.

Mr. COSTELLO. The Chair thanks the gentleman from New York, and now recognizes the gentleman from North Carolina, Mr. Coble.

Mr. COBLE. Mr. Chairman, don't ever offer us a chance to make an opening statement, because we will grab the mike without exception.

You and the Ranking Member have already said it, but I would like to repeat it, and I don't think we can repeat it often enough: Captain Sullenberger, First Officer, Flight Attendants, Air Controllers, Passengers, it appears all of you remained calm in a very, very stressful climate; and you are to be commended. I guess, Captain, probably the most famous quote of 2009 will be the calmly spoken phrase, ″We are going to be in the Hudson.″ And you were indeed there, but you all were heroes as far as I am concerned.

And Mr. Chairman, I thank you and Mr. Petri for having called this hearing.

Mr. COSTELLO. The Chair thanks you, and now recognizes the gentleman from New York, Mr. McMahon.

Mr. MCMAHON. Thank you, Mr. Chairman and Ranking Member Petri.

I am Mike McMahon, a new Member of Congress from Staten Island, New York, which of course is very close to where this miracle on the Hudson occurred. And I have a prepared statement, but in the interests of time, I won't read it; but just say to you, to all of you, on behalf of the people who were on the ground, in that harbor; and through the—you know, really as we all know through the horrors of 9/11 and then 2 years after we had the horrible ferry crash right in our harbor—you saved not only the lives of the people on that plane, and yourselves, thank God, but also so many people on the ground as well.

On behalf of them, the countless many lives you saved, we thank you as well.

And we are here today to learn from your experiences to make air travel more safe. And certainly people talk about it being a miracle on the Hudson, but as we know, it was no miracle. You were well trained.

But there was something more. In your hearts there was courage. And we know that heroes are ordinary people who do extraordinary things in any given moment. And to all of you, you are heroes for the lives you saved and what you did risking your own lives.

On behalf of the people I represent, all New Yorkers and all New Jerseyites, thank you and God bless you.

Mr. COSTELLO. The Chair thanks the gentleman and recognizes the gentleman from Michigan, Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. I will be very brief.

First of all, I wanted to thank you for being here. And I am also thankful, since I am a sometime pilot, that you were piloting that plane and I wasn't. It made all the difference in the world, I am sure. But I also thank the Lord that all of you are here and all the passengers, and you are safe and sound. And thank you very much.

Yield back.

Mr. COSTELLO. The Chair thanks the gentleman from Michigan and recognizes the gentleman from Arizona, Mr. Mitchell.

Mr. MITCHELL. Thank you, Mr. Chairman. I want to take this opportunity to commend the unparalleled bravery exhibited by Captain Chesley Sullenberger and his crew on US Airways Flight 1549 on January 15, 2009. You know, the cool heads, sound judgment, and practiced safety procedures saved not only 155 lives on board, but countless more that could have been injured or killed on the ground.

I am so proud that US Airways calls Tempe, Arizona, home, which is also my home; and I am also especially proud of the heroic crew of Flight 1549. I look forward to hearing more from our witnesses on what happened on that fateful day and what we can do to further prevent other incidences.

I yield back.

Mr. COSTELLO. The Chair thanks the gentleman and now recognizes the gentlelady from California, Ms. Richardson.

Ms. RICHARDSON. Yes. Thank you, Mr. Chairman. I know you are looking forward to getting this under way, so I will be as brief as possible.

First of all, I want to applaud you, Mr. Chairman. I have been on this Committee my entire time now being in Congress, and you always put the most pertinent issues right on the table right away—good, bad, or indifferent. And this is no exception in your approach to the work that we do in this Committee. So thank you for the access and what we will be able to learn in this hearing, in particular.

It is not uncommon that we have safety hearings, as I just said, related to what is going on in the air. Chairman Costello has been very aggressive in that fact. And I also look forward to learning from something that happened right. Oftentimes, we are looking at the wrong situations, but clearly this situation we need to duplicate.

To the air traffic controllers who sometimes—it was—you are the silent angels out there. When I heard the radio of what you guys were talking about going back and forth, them giving different options and trying to assist, I think is also worthy of acknowledgment.

But finally, let me say to, I believe it is the flight attendant Ms. Welsh, who I had an opportunity to watch—is that you right here? Yes.

I had an opportunity to see several interviews. And I hope what you will stress in your testimony is the unfortunate part of what I think happened in the rear of the plane. And as has been said by other people, we fly. I fly from California two times a week. And I have never heard that if you happen to land on water you don't want to, you know, open the rear end of the airplane.

So to the degree that we all sit there and we hear the instructions week after week after week, I never recall hearing that. And so whatever you can share with us as a body of what we can do maybe from a safety or regulation perspective to stress to the public that not every situation is going to be typical and how we have to adjust—and thank goodness you were there and were able to assist us. And I look forward to your testimony.

Thank you, Mr. Chairman.

Mr. COSTELLO. The Chair thanks you. And now we will recognize our witnesses. Let me introduce the witnesses on our first panel. Captain Chesley Sullenberger, III, who now is known to America as ″Sully″; our First Officer, Jeffrey Skiles; Flight Attendant Sheila Dail, Flight Attendant Donna Dent, and Mr. Patrick Harten, who is the Air Traffic Control Specialist, New York Terminal Radar Approach Control.

And now I will yield to my friend from Pennsylvania, Mr. Altmire, to introduce Doreen Welsh.

Mr. ALTMIRE. And I thank the Chairman. And I didn't want to let the moment go by without recognizing that on January 15th the entire country saw the unmatched courage, skill, and heroism of the entire crew. But in western Pennsylvania we were especially proud of Flight Attendant Doreen Welsh, who is going to testify today.

So as a constituent, I just want you to know that I am proud of you, and western Pennsylvania is incredibly proud of your efforts on that day. And thank you for being here.

Mr. COSTELLO. The Chair thanks the gentleman.

TESTIMONY OF CAPTAIN CHESLEY B. SULLENBERGER, III, FIRST OFFICER JEFFREY B. SKILES, FLIGHT ATTENDANT SHEILA DAIL, FLIGHT ATTENDANT DONNA DENT, AND FLIGHT ATTENDANT DOREEN WELSH, US AIRWAYS, INC.; AND PATRICK F. HARTEN, AIR TRAFFIC CONTROL SPECIALIST, NEW YORK TERMINAL RADAR APPROACH CONTROL

Mr. COSTELLO. And now we will recognize Captain Sullenberger.

And let me say that for all of our witnesses on both the first and second panel, that we will be under the 5-minute rule. We would ask that you summarize your testimony. Your entire testimony will be submitted for the record. And of course after your testimony, we will get to questions from Members.

So Captain Sullenberger, you are recognized.

Mr. SULLENBERGER. Thank you, Chairman Costello, Ranking Members Mica and Petri, and other Members of the Committee. It is my great honor to appear before the Aviation Subcommittee today.

I am proud of the fact that I have been involved in aviation for the last 42 years. During that time, I have served our country as a U.S. Air Force pilot, served as an Air Line Pilots Association local Air Safety Committee Chairman, accident investigator, and national technical Committee Member. I have amassed a total flying time of almost 20,000 hours, and flown approximately 1 million passengers in my 29 years as a professional airline pilot.

I have served as a check airman and a Crew Resource Management course developer and facilitator. I am also the founder of Safety Reliability Methods, Inc.

Before I begin, I must first say that my heart goes out to all those affected by the tragic loss of Continental Connection Colgan Air Flight 3407. Words cannot express my sadness and grief at the loss of 50 lives. The families of those no longer with us are in my thoughts and in my heart.

The events of January 15, 2009, have been well documented, and rather than recite them now in great detail, I want only to reiterate to the Subcommittee that the successful outcome was achieved by the actions of many. Lives were saved due to the combination of a very experienced, well-trained crew, First Officer Jeff Skiles, and Flight Attendants Donna Dent, Doreen Welsh, and Sheila Dail, all of whom acted in a remarkable display of teamwork, along with expert air traffic controllers, the orderly cooperation of our cool-headed passengers, and the quick and determined actions of the professional and volunteer first responders in New York City.

The events of January 15th serve as a reminder to us all of the daily devotion to duty of the many thousands of aviation professionals who keep air travel safe, and also as a reminder of what is really at stake. I, like thousands of my professional airline pilots, know that flying a large commercial airline is a tremendous responsibility. We clearly understand that our passengers put their lives in our hands. We know that we must always be prepared; we must always anticipate; we must always be vigilant. Expecting the unexpected and having an effective plan for dealing with it must be in the very makeup of every professional airline pilot.

I am not only proud of my crew, I am proud of my profession. Flying has been my lifelong passion. I count myself fortunate to have spent my life in the profession I love, with colleagues whom I respect and admire.

But while I love my profession, I do not like what has happened to it. I would not be doing my duty if I did not report to you that I am deeply troubled about its future. Americans have been experiencing huge economic difficulties in recent months, but airline employees have been experiencing those challenges and more for 8 years. We have been hit by an economic tsunami.

September 11th, bankruptcies, fluctuating fuel prices, mergers, loss of pensions, and revolving-door management teams who have used airline employees as an ATM have left the people who work for the airlines in the United States with extreme economic difficulties. It is an incredible testament to the collective character, professionalism, and dedication of my colleagues in the industry that they are still able to function at such a high level.

It is my personal experience that my decision to remain in the profession I love has come at a great financial cost to me and to my family. My pay has been cut 40 percent, my pension, like most airline pensions, has been terminated and replaced by a PBGC guarantee worth only pennies on the dollar.

While airline pilots are by no means alone in our financial struggles, I want to acknowledge how difficult it is for everyone right now. It is important to underscore that the terms of our employment have changed dramatically from when I began my career, leading to an untenable financial situation for pilots and their families. When my company offered pilots who had been laid off the chance to return to work, 60 percent refused.

Members, I attempt to speak accurately and plainly, so please do not think I exaggerate when I say I do not know a single professional airline pilot who wants his or her children to follow in their footsteps. I am worried that the airline piloting profession will not be able to continue to attract the best and the brightest.

The current experience and skills of our country's professional airline pilots come from investments made years ago, when we were able to attract the ambitious, talented people who now frequently seek professional careers elsewhere. That past investment was an indispensable element in our commercial aviation infrastructure, vital to safe air travel and our country's economy and security. If we do not sufficiently value the airline piloting profession and future pilots are less experienced and less skilled, it logically follows that we will see negative consequences to the flying public and to our country.

We face remarkable challenges in our industry. In order to ensure economic security and an uncompromising approach to passenger safety, management must work with labor to bargain in good faith, we must find collective solutions that address the huge economic issues we face in recruiting and retaining the experienced and highly-skilled professionals that the industry requires and that passenger safety demands. But further, we must develop and sustain an environment in every airline and aviation organization, a culture that balances the competing needs of accountability and learning.

We must create and maintain the trust that is the absolutely essential element of a successful and sustainable safety reporting system to detect and correct deficiencies before they lead to an accident. We must not let the economic and financial pressures detract from a focus on constantly improving our safety measures and engaging in ongoing and comprehensive training. In aviation, the bottom line is that the single most important piece of safety equipment is an experienced, well-trained pilot.

Despite the bad economic news we have experienced in recent times, despite the many challenges we face as a country, I have faith in America, in our people, in our promise. I briefly touched upon some major problems in my industry today, but I do not believe that they are intractable should we decide to work collectively to solve them.

We all have roles to play in this effort. Despite the economic turbulence hitting our industry, the airline companies must refocus their attention and their resources on the recruitment and retention of highly-experienced and well-trained pilots, and make that a priority that is at least equal to their financial bottom line.

Jeff and I and our fellow pilots will fly our planes and continue to upgrade our education and our skills while we attempt to provide for our families. Patrick and the other talented air traffic controllers will continue to guide us safely through the skies. Our passengers will spend their hard-earned money to pay for their travel. And our flight attendants, mechanics, ground crews, and administrative personnel will deal with the thousands of constant details and demands that keep our planes safely in the air.

You can help us, Mr. Chairman, honorable Members, to work together across party lines and can demand or legislate that labor, management, safety experts, educators, technical experts, and everyday Americans join together to find solutions to these problems.

We all honor our responsibilities in good faith and respect one another. We must keep the American commercial aviation industry safe and affordable for passengers, and financially viable for those who work in the industry day-to-day. And for those talented young men and women considering what to do with their lives, we must restore the narrative of a compelling career path in aviation with sufficient economic resources to once again make this vision a reality.

Thank you for your kind attention and for the opportunity to share my experiences with this Committee.

Mr. COSTELLO. We thank you, Captain Sullenberger.

And now the Chair recognizes First Officer Skiles.

Mr. SKILES. Thank you, Chairman Costello and Ranking Members Mica and Petri, and Members of the Committee. I am also honored to appear before the Aviation Subcommittee today. I am going to summarize my statement, which I have already submitted.

I think the word of the day today is ″experience,″ obviously, looking at us. I myself have 20,000 flying hours. I have been a captain at US Airways in the past, but due to cutbacks, I am flying as a first officer right now. And I have been flying for 32 years myself.

Much has been made of the cockpit crew and our participation in this, but I think it would be remiss if I didn't acknowledge once again the fantastic contribution that Donna Dent, Doreen Welsh,

and Sheila Dail made to the successful outcome that day; and also the captains and crews of the ferry boats, the first responders, air traffic controllers. Obviously, in the press they are calling us heroes, but there were a whole lot of heroes on that day.

Our profession carries a tremendous responsibility. And this has brought into me a renewed appreciation for the fact that this is a serious job for serious people. We have dedicated our lives to this profession, and it appears as if on that particular day we were five people in the right place at the right time.

Sully and I have 70 years and 40,000 hours of flying between us; and the flight attendants have many, many years between them. In fact, if I told you, you would probably investigate US Airways for violating child labor laws on the date that they were hired.

One of our concerns, though, is that this is something that is fading from our industry. Newly hired pilots at our affiliate carriers have as little as 300 flying hours when they start work. When I was hired, they required 3,000 hours to even be considered for an interview.

What the country has experienced financially in the last 8 months we have experienced for the last 8 years in our industry since 9/11. Financial turmoil, bankruptcies, layoffs, and revolving-door management teams have decimated our airlines and our careers. I myself make about half of what I once made, and I have lost my retirement to a PBGC promise.

Many pilots work two jobs. I myself am a general contractor. Sully does consulting. We work 7 days a week, and we split our focus between our two careers to maintain our middle-class lifestyles.

When I was hired in this business there were airline dynasties. Whole families were employed in the aviation business. You would fly with a captain, he might have five children, they all were pilots, flight attendants, agents. Now I know of no one that encourages their children to go into aviation.

We are extremely grateful for the outpouring of support and gratitude that we have received. But we do feel the responsibility to our fellow pilots to advocate for them. Our labor negotiations system does not work; we are not looking for special privileges, but we are looking for a level playing field.

The balance of power has shifted greatly, and the state of the piloting profession is the proof. National Mediation Board negotiations drag on forever. We would ask that you look at possible reforms of the National Mediation Board, and also the Railway Labor Act that we work under.

Our colleagues have rallied around us in this. And we believe that we showed what well-trained professional crews can do in times of crisis. And we are gratified that our colleagues in aviation seem to look at us as a positive reflection of themselves and our shared professions.

We ask that Congress take seriously the challenges that we aviation professionals face. And we ask that Congress work with us to protect our profession so that in the future we can attract the best and the brightest to be pilots and flight attendants in America.

Thank you.

Mr. COSTELLO. The Chair thanks you, Mr. Skiles, and now recognizes for any testimony, comments that the flight attendants would like to add, and now recognizes Sheila Dail.

Ms. DAIL. Thank you very much, Mr. Chairman and fellow Congressmen of the Committee. I do not have a prepared statement. But I will be happy to answer any questions or comments concerning my profession, my training, my experience. I am open to anything today.

Mr. COSTELLO. We thank you, and we thank you for being here. The Chair now recognizes Donna Dent for any comments that she would like to offer.

Ms. DENT. Mr. Chairman, I, as well, do not have a prepared statement, and I also would be—I feel very honored to be here, and am more than ready to answer any questions that anyone may have for me.

Mr. COSTELLO. Ms. Welsh?

Ms. WELSH. Same thing, Mr. Chairman. We did not prepare statements, the flight attendants, but we are willing to answer questions. And it is an honor to be here. Thank you.

Mr. COSTELLO. We thank you. We thank all three of you for being here. And the Chair now recognizes Mr. Harten for his testimony.

Mr. HARTEN. Good morning, Chairman Costello, Ranking Member Petri. My name is Patrick Harten. I have been an air traffic controller at the New York TRACON, and a proud Member of the National Air Traffic Controllers Association for the past 10 years.

While January 15, 2009, is forever etched in my memory, it began unremarkably. I arrived at work at 12:30 p.m. to begin my 8-hour shift. At 3:12 p.m., I was assigned to work LaGuardia radar position. This position handles all departures from LaGuardia Airport. At 3:25 p.m., the LaGuardia tower control advised me that Cactus 1549 was the next departure rolling for takeoff. Just for clarification, Cactus is the call sign for US Airways. It was a routine, westbound departure off Runway 4, traveling due north on a 360-degree heading and climbing to 5000 feet.

I instructed Cactus to climb to 1-5000 and turned my attention to another aircraft to give him instructions under my control. I then turned back to Cactus 1549 and instructed him to turn left to a heading of 270, heading the aircraft towards its destination. That is when the captain advised me that they suffered a bird strike, lost thrust in both engines, and needed to return to LaGuardia for an emergency landing.

When a pilot tells a controller he needs to make an emergency landing, the controller must act quickly and decisively. I made a split-second decision to offer him Runway 13, which was the closest to his current position, and turned him left to a heading of 220 so he could return to the airport. I then immediately contacted LaGuardia tower and asked them to stop departures and clear the runway for an emergency return.

While I have worked 10 or 12 emergencies over the course of my career, I have never worked an aircraft with zero thrust capabilities. I understood how grave the situation was. After I gave him his instructions, the captain very calmly stated, ″We are unable.″ I quickly vectored another aircraft that was still in my airspace,

and gave 1549 a second option, land on LaGuardia Runway 31. Again the captain said, ″Unable.″

I then asked the captain what he needed to do to land safely. At this point, my job was to coordinate and arrange for the pilot to be able to do whatever was necessary. The pilot told me he could not land on any runway at LaGuardia, but asked if he could land in New Jersey and suggested Teterboro.

I had experience working traffic into Teterboro from my time working in the Newark sector. And after coordinating with the controllers in Teterboro, we were able to determine that Runway 1 was his best option. It was an arrival runway and clearing it for an emergency landing would be easier and faster. It also meant 1549 would be landing into the wind, which could have assisted the pilot in making a safe landing.

I called Teterboro and explained the situation. The controller at Teterboro reacted quickly, and prepared Runway 1 for the emergency landing. I then instructed the captain to turn right to a heading of 280 to land Runway 1. The captain replied, ″We can't do it.″

I replied immediately, ″Which runway would you like at Teterboro?″ The captain replied, ″We are going to be in the Hudson.″ I asked him to repeat himself, even though I heard him just fine. I simply could not wrap my mind around those words. People do not survive landings on the Hudson River, and I thought it was his own death sentence. I believed at that moment I was going to be the last person to talk to anyone on that plane alive.

I then lost radio contact with 1549, and the target disappeared from my radar screen as he dropped below the tops of the New York skyscrapers. I was in shock. I was sure the plane had gone down. Less than a minute later, 1549 flickered back onto my radar scope. The aircraft was at a very low altitude, but its return to radar coverage meant there was a possibility 1549 had regained use of one of its engines. Grasping at that tiny glimmer of hope, I told 1549 that it could land Newark, 7 miles away, on Runway 29, but I received no response. I then lost radar contact again, this time for good.

I was relieved from my position a few moments later, as soon as it was possible. I was in no position to continue to work air traffic. It was the lowest low I have ever felt.

I wanted to talk to my wife, but I knew if I tried to speak or even heard her voice I would completely fall apart. I settled for a hasty text message: ″Had a crash. I am not okay. Can't talk now.″ When I got home, she told me she thought that I was in a car accident. Truth was, I felt like I had been hit by a bus.

It took 6 hours before I could leave the facility. I had to review the tapes, fill out paperwork, and make an official statement. It may sound strange, but for me the hardest, most traumatic part of the entire event was when it was over. During the emergency itself I was hyper-focused. I had no choice but to think and act quickly and remain calm. But when it was over, it hit me hard. It felt like hours before I learned about the heroic water landing Captain Sullenberger and his crew had managed.

Even after I learned the truth, I could not shake the image of tragedy in my mind. Every time I saw the survivors on television,

I imagined grieving widows. It has taken over a month for me to be able to see that I did a good job. I was flexible and responsive; I listened to what the pilot said and made sure to give him the tools that he needed. I stayed calm and in control.

I returned to work this week. And while it may take some time for me to regain my old confidence, I know I will get there.

I would like to end by personally recognizing the captain and crew of Flight 1549 for their professionalism, skill, and heroic efforts that day. I would like to recognize the professionalism of the other controllers who helped clear the skies and the runways for 1549, as well as the engineers who helped ensure that the aircraft itself could survive landing in the Hudson, and that those inside would be safe. Finally, I want to thank my wife Regina. She has been my rock these past few weeks, as she always has and always will be. I couldn't have survived this without her.

Thank you, Mr. Chairman. I am prepared to answer any questions you might have.

Mr. COSTELLO. We thank you, Mr. Harten.

The Chair now recognizes Mr. Sullenberger.

I would like you to respond to a few questions from the Chair, if you would.

Mr. SULLENBERGER. Yes, Mr. Chairman.

Mr. COSTELLO. As Mr. Harten just walked us through his experience from the moment that he knew that you were in trouble, I wonder if you would do the same for the Committee members as well, from the moment that you realized that you had a problem, and walk us through the events that took place until you landed in the Hudson.

Mr. SULLENBERGER. Yes, of course.

First, Patrick, I want to say I am grateful for your assistance that day and since. And this is the first time I have heard the detail of your experience, and I am greatly touched by it.

It was, as Patrick said, a completely unremarkable flight. It was First Officer Skiles' turn to fly the airplane. We had been alternating legs. The takeoff and initial departure were normal, up until the point when the wind screening was filled by birds. We saw them just a matter of seconds before impact, with no time to react.

At the point of impact, we heard the thumps of the birds striking the aircraft. It was obvious that they were large, and there were many of them. I immediately began to feel vibrations, abnormal, rough vibrations coming from both engines. I began to hear loud, abnormal noises coming from the engines, indicating severe damage. And I quickly began to smell in the cabin's circulated air what I have experienced before, and that is a burned bird smell going through the engines.

After a few seconds, we had a nearly complete, immediate, bilaterally symmetrical loss of thrust that I had never experienced before. I knew immediately that the situation was dire. At that point, I thought the best plan was for me to fly, since I had the greater experience in this particular aircraft type, and that the division of duties was for Mr. Skiles to run the checklist, since he had so recently been through training on the airplane and knew the checklist intimately, which is what we did.

I said, ″My aircraft,″ and took control; and following the correct protocol, Jeff immediately said, ″Your aircraft.″ At that point, I lowered the nose to maintain and attain a safe flying speed, and Jeff immediately turned to the appropriate checklist, and began working valiantly and desperately—ultimately vainly—to restart the engines.

We quickly assessed the situation. We quickly considered and then rejected the nearest runway alternatives as being unattainable. I knew that I could not afford to choose unwisely, that the cost for attempting to land on a runway I could not quite make could well be catastrophic not only for those on board, but for everyone on the ground.

It was clear early on that the only place that was large enough, wide enough, smooth enough to land a jet airliner was the Hudson; and we began to plan the landing and take the appropriate steps to make it happen. And I would just reiterate what Jeff has said, that it was a team effort from start to finish. It required a highly experienced, highly trained crew of pilots and flight attendants. It took highly experienced travelers in the cabin, business travelers who had traveled many times before, taking the lead from our flight attendants, who remained calm and professional at all times, acted admirably, and of course the first responders in New York.

By the time I left the airplane there were already boats around the aircraft rescuing passengers.

Mr. COSTELLO. First Officer Skiles, would you like to add anything?

Mr. SKILES. Well, it was 3 minutes of my life, not very long, and I do have a—not that great a memory of it, to start with. But certainly I think that Captain Sullenberger covered all the high points and the low points.

Thank you.

Mr. COSTELLO. Thank you.

For the flight attendants, we heard what took place from the air traffic control tower, and we have heard what took place from the cockpit. I wonder if you might tell us, as soon as you discovered that there was a problem, what you did; and walk us through it. Whoever would like to lead.

Ms. Welsh, would you like to go?

Ms. WELSH. Well, like I said before, we heard a thump, which was the birds, which we didn't know at that time. And it was kind of like hitting something in the air. And then in the back, where I was, the smell was pretty strong. And I thought, for some reason, there might have been an electrical fire. That was just my guess at the moment.

So I got up and I looked for Sheila, saw Sheila up front, but our interphones didn't work. So really, in that time span, I thought, well, we probably lost an engine, and we were going to go back and land at LaGuardia and that would be that. So I got back in my seat, and not long after that I heard, ″Brace for impact.″ And—you want me to go on with that?

Mr. COSTELLO. Please.

Ms. WELSH. Well, you know, it is words you don't want to hear as a flight attendant, but I didn't know, I think Jeff said it was 3 minutes. I have always wanted to know from start to finish, be-

cause at some moments it seemed long and at some moments it seemed like a snap.

But it seemed—after the ″Brace for impact,″ it seemed quick to me that we did hit, which I assumed we were on the ground for some reason. I thought we attempted to go back to LaGuardia—I might have just thought this in my head, and I don't know why—and we were on the runway and didn't make it.

So after getting out of my seat and going to the—because my doors are behind me—after going to the door and looking out and seeing water—Whoa, like I said, that was the biggest shock ever. So I gave it one second thought, Can I get one—because we landed in the back, but we still weren't down; like we saw the plane—I thought, Do I have one second to get a raft out of here? And that water was rising.

And I thought, No. And as I turned around, passengers shoved by me and just started grabbing everything on the door and cracked the door. So that is when the water started coming in rapidly.

And I went back to try to close it, and then it was coming in just—I don't know the time, but it was just rising like crazy. I went back again with both hands and tried to close it, but it just wasn't going to happen, and turned around and saw there were so many people.

I assumed for some reason, like I said before, that the whole plane was even. So I thought we were all going to be under that water. It is just how I thought.

And then, at the last minute, I just got this burst and started—people were in shock like I was, or had accepted that this was pretty much it, because the water was just about there. And I just went crazy and started ordering people to go to the wings, and having them climb—we never would have all made it down that aisle.

So I started having people that were able to climb over the seats, I said, ″Just make your goal get to the wings; that is our only hope. Get to the wings. We have seconds.″ So the few people that were in front of me, looking back, they had to be in shock like I was for a second there with that water.

And then I screamed and snapped them out of it, and got up to the wings, and like I said before, I thought, might make it. So after everybody there, it might have been one or two people that followed me, I saw Sheila and went up to the 1-R door and went out on the raft.

And that is when I realized I was injured, because I didn't know until then.

Mr. COSTELLO. And can you describe for the Members of the Committee your injury, what happened to you?

Ms. WELSH. Well, I don't know. But—I mean, I didn't realize until I got to the front door that I felt the pain and everything. I obviously walked into something or—I had heard that something had come up from the floor. But my guess is that I did it after entering that ice water, because I wouldn't have felt it.

So I have no idea what—I couldn't even begin to guess what I did it on. It is like an angle iron, it is like an L-shape, so I can't even imagine.

Mr. COSTELLO. If I can ask the same question of you, Ms. Dail.

Ms. DAIL. When we were sitting in our jump seats and heard the thump, Donna and I had just a moment to whisper. I whispered to her, ″What was that?″ And she said, ″I think it was a bird strike.″ I never experienced such a bird strike. The few moments between then, it was eerily quiet. I smelled the smell. There was a little bit of smoke when I looked down the aisleway. But actually, we just sat there waiting. We knew the guys were busy up front. At some point they would tell us what to do. And when we heard the command, ″Brace for impact,″ our training just kicked in and we began our commands.

And then, when we hit the water, we just followed through with what we yearly—we have a yearly recurrent training. And I was due for mine the following week, and had my workbook filled out; so I had looked over the information. And Donna had recurrent the next week after me.

But the training, I only have to say, the recurrent training that I have gone through for 28 years prepared me to do what I did.

Mr. COSTELLO. Ms. Dent?

Ms. DENT. We did have a very different experience up front. It was much calmer, I think, and very civilized. When we realized that—when we heard the ″Brace for impact,″ as Sheila said, we began our commands. And when we heard the evacuation command, we started yelling our evacuation commands. But at that point we didn't know we were in water.

So when I assessed, I looked out my window and saw that there was movement, I thought we were still on land. And I thought we were moving. So I yelled for Sheila to wait, not to open her door yet.

And then I yelled, ″We are in water,″ and opened my door, inflated my slide, and just started evacuating the passengers.

Mr. COSTELLO. We thank you. And we will have—I will have other questions, and I am sure other Committee Members will as well.

The Chair now recognizes the Ranking Member of the Full Committee who has joined us, Mr. Mica.

Mr. MICA. Thank you, Mr. Costello, for holding this hearing. Mr. Petri also. And I see Mr. Oberstar, our Chairman, who has joined us.

I had a few questions.

First of all, the whole country, you know, is enamored with you all, the crew, and air traffic controllers who did such a great job. So I join in praising you. We are very proud of you.

And it is a picture of success and the way things should have worked. And the good Lord gave us a great day and a lot of people we can be proud of. So I thank you in that regard.

But our job, too, is to look at what happened, and also see if we can improve on what occurred. And the questions I ask are in that vein, to—hopefully, a positive vein.

First of all, last night I was Googling somebody, a little thing that somebody said that "Mica is as crazy as a bed bug," that this wasn't birds, it was defective engines.

Captain Sullenberger, First Officer, do either of you know—first of all, what was the plane, the aircraft?

Mr. SULLENBERGER. The aircraft type was an Airbus 320.

Mr. MICA. Was there any defect that you are aware of in the engines of any of those aircraft, Captain or First Officer?

Mr. SULLENBERGER. No.

Mr. SKILES. No.

Mr. MICA. Nothing was related to an engine failure. And it was interesting the first time I heard you say, Captain, that you saw not just one bird, you saw many birds. You said, ″many birds,″ Captain?

Mr. SULLENBERGER. Yes. When I first noticed the birds, they completely covered our view out the front window.

Mr. MICA. Did you see many birds, First Officer?

Mr. SKILES. Yeah, I probably saw them a little bit before Sully. And there was a large number of birds all flying in a line, as you would normally see geese fly.

Mr. MICA. Okay. He gave you permission to go to 1500. When you hit the birds, were you at 2000 or something? What was the—do you know the estimated altitude that the strike occurred?

Mr. SULLENBERGER. Our initial altitude clearance was to 5,000. We were given clearance to 15,000.

Mr. MICA. Okay. I am sorry.

I heard 2900 feet at the bird strike. Is that about right?

Mr. SULLENBERGER. I have not seen the data from the flight data recorder.

Mr. MICA. You were above 1500, though?

Mr. SULLENBERGER. I think that that range of 2900 to 3000 is probably a good place to start.

Mr. MICA. Okay. Let me talk to the air traffic controller, Mr. Harten.

You were at a panel, and you had a radar screen that could detect, you could detect any obstacles to flight and also aircraft, correct?

Mr. HARTEN. Yeah. I could see aircraft.

Mr. MICA. Was that the latest technology or was it old technology?

Mr. HARTEN. I mean the radar scopes we work with, I think we have had for about 8 years, 7 years.

Mr. MICA. Adequate. Now, I am told that sometimes air traffic controllers dumb down the equipment, the radar equipment to eliminate some of the clutter. Do you know if the equipment that you had was dumbed down in any way to eliminate any of the clutter?

Mr. HARTEN. It was not. I am not familiar—what do you mean ″dumbed down″?

Mr. MICA. Well, that you couldn't detect certain objects. What they do is, there is clutter on the screen; and I am told——

Mr. HARTEN. Well, what we can do is, we can adjust our filter limits. And that will get rid of some data blocks——

Mr. MICA. Right.

Mr. HARTEN. —transponders, altitude, low aircraft——

Mr. MICA. Had you adjusted your equipment in any way to——

Mr. HARTEN. Well, working LaGuardia departure, we look from the ground up to——

Mr. MICA. Are you able to ever detect—now, these are, I am told, Canadian geese, 12 to 24 pounds. And I am told by the crew that there was a flock. Is that normally detectable?

Mr. HARTEN. Not often. Sometimes you can see a primary target on the scope with the large——

Mr. MICA. NTSB has seen the records of the—and they now have the records.

Mr. HARTEN. My scope, yes.

Mr. MICA. Do those records also record the level at which any clutter is removed from the screen?

Mr. HARTEN. Yes, they would have that information.

Mr. MICA. Okay. So that is with them now.

There was not any avian hazard detection equipment at that site; is that right?

Mr. HARTEN. No, there is not.

Mr. MICA. Are you aware of the equipment that they do have that the Air Force and NASA use?

Mr. HARTEN. No, I am not familiar with that.

Mr. MICA. You aren't. Okay. Because I do know that there is equipment. You are aware of that.

Have you ever been able to detect on any radar screen any avian activity?

Mr. HARTEN. On occasion, if it is a large enough flock of birds, and they are at an altitude where we can see them, we will get what is called a primary target. And that is just basically a dot on the radar scope. There is no way of telling if that is a bird or not.

Mr. MICA. And you did not see that that day?

Mr. HARTEN. There was nothing on the scope.

Mr. MICA. We will find out what the screens—or what the radar detection was set for. Now, as an air traffic controller, too, you have a limited number of options to send them out of LaGuardia. And you are aware that for some 30 years, we still have the same routes out of the New York airspace. Correct?

Mr. HARTEN. Yes.

Mr. MICA. The last 18 years, we have been trying to redesign that. So the choices for Sullenberger to take that U.S. Air aircraft out of LaGuardia are basically what is shown up there—the color. Is that correct? Those are your choices of airspace exit for him?

Mr. HARTEN. That looks like a 360 heading off 4 runway heading and 155 heading.

Mr. MICA. But those are your choices?

Mr. HARTEN. Those are coordinated ahead of time with all four departures.

Mr. MICA. Are you aware that we are trying to enhance some of the departure by redesign of the airspace—put that one up there—which would give you a few more choices. You don't have these choices now, do you?

Mr. HARTEN. No, we do not. I can tell you right now, some of those wouldn't work.

Just being honest.

Mr. MICA. But my point is you are limited in your choices of departure. Is that correct?

Mr. HARTEN. Yes.

Mr. MICA. And that the design of the airspace is still limited to what was done some nearly three decades ago. And my point is that we haven't redesigned that airspace in some—we have been working on it 18 years, and we still don't have it.

So you have limited choices, you have limited technology. I am just trying to look at what our options are to make certain that this doesn't happen again, or that you have the tools to make certain that you have options. Okay.

Mr. HARTEN. Okay.

Mr. MICA. Let me just ask you one more question for everyone and I will be through. Experience is a key to everything here. Go down again and tell me again how much experience for the record each one of you had.

Captain.

Mr. SULLENBERGER. I learned to fly 42 years ago, but at the airline, 29 years. I have just about 20,000 hours of flying.

Mr. MICA. First Officer.

Mr. SKILES. I have 32 years of flying, and I have slightly more than 20,000 flying hours.

Mr. MICA. Ms. Dail.

Ms. DAIL. Twenty-nine years.

Mr. MICA. Ms. Dent.

Ms. DENT. Twenty-six years.

Mr. MICA. Ms. Welch.

Ms. WELCH. Thirty-eight years.

Mr. MICA. Lastly, Harten.

Mr. HARTEN. I have 10 years' experience.

Mr. MICA. One final question for you. And this is important because we get a lot of criticism about the aging or demographics of our air traffic controllers. You are fairly young, but you have got good experience. Were there backup personnel at your experience that had adequate experience?

Mr. HARTEN. Yeah, there were experienced controllers around me, yes. There wasn't a backup for my position. There wasn't someone standing behind me.

Mr. MICA. Again, we have to know, were you properly staffed and backed up?

Mr. HARTEN. I am not sure what the staffing was that day, to be honest with you.

Mr. MICA. But when you went off, some junior guy that was just wet around the ears was going to take over. That would not be happening, right?

Mr. HARTEN. We have one guy that has only about a year and a half experience.

Mr. MICA. Would there be a possibility of him taking over?

Mr. HARTEN. Taking over for me? During the event?

Mr. MICA. At any point.

Mr. HARTEN. He could have worked departure.

Mr. MICA. That is what I need to know because our air traffic controllers express concern about the backup that they have, and I need to know who was there and how we man those important positions with qualified personnel.

Thank you all very much. I appreciate it. Yield back.

Mr. COSTELLO. The Chair thanks the gentleman, and now recognizes the distinguished Chairman of the Full Committee, Chairman Oberstar.

Mr. OBERSTAR. Thank you, Mr. Chairman. To the witnesses before us, you represent the very best of aviation. Lindbergh would be proud of you. Your management of the immediate impact and the aftermath of that impact, and the tragedy, are testimonial. They are exemplary of what we expect and what America sets forth for the world in excellence in aviation service. Captain Sullenberger, I think you've got jet fuel in your veins.

I think the lesson of this experience is not which route, what we are doing with the east coast departure and arrivals, routing systems can be a very complicated thing and go on for many years; whether we can do it or not, whether it impacts people's lives and livelihoods or not. The lesson is CRM: Crew Resource Management.

The communication between captain and first officer, the instant, to me, it's like the Harlem Globetrotters. The ball goes in the air. Somebody else knows what to do with it. That is what you did. Immediately you knew what to do. You didn't haul out a manual in the cabin, you didn't haul out a manual and look at things. You knew exactly what to do.

In the cab, the air traffic control tower, you knew what to do. Your calm, steady voice offering options, offering choices for the flight deck crew, is what we expect the best of air traffic control.

It wasn't always so. In 1985, in January, at Reno, Nevada, a Lockheed Electra took off with 94 passengers on board. In a minute and four seconds after departure, the crew heard a thunk, thunk. Thunk, thunk. Both the captain and first officer began troubleshooting. They forgot to fly the aircraft. It crashed. Ninety-three people died. One 14-year old lad survived.

The NTSB investigation found that the proximate cause of the thunk was an open door on the hull of the aircraft. An access door, just a little one like this, that hadn't closed. It was flapping back and forth. But the immediate cause was the failure of the crew to fly the aircraft. And they began this very long, intense renewal of heightened attention to the communication in the flight deck and in the cabin.

A few years later, in Sioux City, Iowa, a United DC 10 was in route, and suddenly it too lost all power. Lost all control of all wing surfaces, all control surfaces. As it turned out, the disk in the tail engine just blew out, just gave out, and flew right through and severed the hydraulic lines, and landed in a cornfield, as it turned out later.

But there too the flight deck crew were communicating with each other constantly and using their combined experience and resources and understanding and knowledge of the aircraft. Each had a role, each played that role, each carried it forward and saved 110 lives. There were fatalities on that tragic instant. And time and again we find the training.

There was another incident, however, in December of 1993, actually, in my district, between my hometown and our nearby community, Hibbing, a Metroliner of Mesaba Airlines, en route to a landing in Hibbing, with 16 passengers on board, and the captain real-

ized he was too high on approach, and made an excessively rapid descent.

As it turned out, the first officer was much junior, with less skill, less experience, less training, and in the flight data recorder reported his concern about the rate of descent. But this pilot had a reputation of being an imperious person, and his right-hand partner was frequently intimidated from raising a voice, raising a concern. That was a failure of CRM.

All persons died as that aircraft descended way too fast, came down below the level needed for approach and ran slam into an abandoned mine dump that we call manmade mountains in our area.

We have all this wonderful technology aboard aircrafts; Mode C transponders and GPS and GPWS and TCAS and ground proximity warning systems. But, in the end, people fly the aircraft.

You had the right pairing. A very seasoned first officer, very seasoned pilot; pilot in command and first officer. And it worked beautifully.

The cabin crew. Next time, I suspect you will trip any passenger who tries to get up and run to the door. But, again, performing professionally. And our air traffic control system.

I wonder, Mr. Harten, were you in an air traffic control facility on September 11?

Mr. HARTEN. I was employed then, but I wasn't working that day. I had the day off.

Mr. OBERSTAR. I have talked with controller after controller who said when they finally got all 5,430 aircraft out of the sky and looked at that blank screen, the hair stood on the back of their necks. Every one of them has had the same feeling.

There is something about this aviation. You know, you have everyday 2 million of our fellow citizens in the air somewhere in the continental United States. And you are responsible for their lives. And when there is nothing on that screen, it sends shivers up your back because you have that attachment, that care. That is the lesson of the survival of this incident.

Keep it up. Thank you for your example, for your courage, and for your professionalism, all of you.

Mr. COSTELLO. Thank you, Mr. Chairman.

The Chair now recognizes the Ranking Member of the Subcommittee, Mr. Petri.

Mr. PETRI. Thank you very much. I really just have a couple of questions. I wonder if any of you have had experience on previous occasions ditching aircraft or close calls and evasive action. You talked of all the years you have been flying. Certainly, I guess part of pilot training is to train for unanticipated emergencies. Could you discuss that a little bit? Clearly, your experience is a big asset. But what does that mean?

Mr. SULLENBERGER. I think the essence of the airline piloting profession is preparation, experience, and training, education. It's an interesting mix of confidence and caution, and it's working very hard never to be surprised. We have to be aware. We have to be alert and vigilant and ready at any moment to meet some ultimate test that we never know if or when will ever occur.

This crew was tested on January 15. We didn't see it coming, but we used our experience and our skill and those of our colleagues and the first responders to make it a successful outcome.

Mr. PETRI. I have sort of a slightly unrelated question. Being from Wisconsin, I represent a place called the Horicon Marsh. We have an enormous number of geese. They used to migrate. They are called Canadian geese. They are supposed to go down south. Unfortunately, in recent time, for a variety of reasons, including hatching these geese and releasing the hatchlings into the bog to supplemental it, thinking they would migrate with the others. They don't. They don't know how to migrate, many of them. They stay around.

Do you think as part of this we should be thinking about clearing the ones that don't migrate off the land? They are a mess for aviation, they are bad for golf courses and recreation, as long as these creatures are turning into enormous pests and they are a huge danger to life, or is that overkill from the goose's point of view? Any of you have any comment on that? Have you seen—is this a really rare experience or are these creatures around a constant threat? They are pretty big. They are not just small birds.

Mr. SKILES. As you know, sir, I am from Wisconsin as well, and I drive by the Horicon Marsh several times a year on camping trips up to the Dorr County area. You are right, you do see an awful lot of geese in that area. But you see geese everywhere. There are so many of them. They seem to really have exploded in population lately.

But I guess personally, I still do think that this was an extremely rare event that may never recur. Just the chance of hitting them, them being in just the wrong place and us just being in the wrong place. I think it is just a fluke. This may never recur again, even if we do nothing about them. Frankly, there are so many of them, I don't know what we would do at this point.

Mr. PETRI. I think, finally, I would be remiss if I didn't give you an opportunity. Several of you in your prepared statements talked about the pressure that the airline industry has been on since 9/11, and really before, since deregulation, and the implications for the profession of being a pilot and for the airlines and so on. Do you have any particular suggestions or areas you think we should be looking on to help increase the chances that we will maintain professionalism in the industry, going forward, which, as you pointed out, has been—is under pressure right now.

Mr. SKILES. Well, the two things that I would suggest is, as I mentioned in my statement, contract negotiations seem to go on absolutely indefinitely, and of course the bankruptcies have just decimated the contracts that we used to have. What we really need is to have a finite timetable within the National Mediation Board process so that they cannot just go on interminably the way they do now, to allow us to rebuild these professions, to make it something that people will aspire to and that people want to do again.

The other suggestion I might have is the Railway Labor Act itself, which we have to work under, actually protects railroads much better than it does airlines. In our case, while we have all the disadvantages of the negotiated process within the Railway Labor Act, we do not have the protections to our contracts that the

Railway Labor Act does provide for railroads, in that it is very easy just to abrogate our contracts as aviation professionals. If we were working for a railroad, they would actually have to negotiate any kind of changes to the contracts, even under the Railway Labor Act.

Mr. COSTELLO. The Chair thanks the Ranking Member, and now recognizes the gentleman from New York, Mr. Hall.

Mr. HALL. Thank you, Mr. Chairman. I want to thank Mr. Harten for your testimony. It seems to me that you describe some of the symptoms of post-traumatic stress. And I would guess that all the crew may have experienced some of the same things, although maybe in different degrees.

As one who worked as a musician most of my professional adult life before I came to Congress, I am used to the term or the saying, ″Don't quit your day job.″ But I am shocked to learn that the captain and first officer are both working a second job so that you can keep flying. I am just shocked, is all I can say.

First Officer Skiles, what you just talked about in terms of the railroad agreement giving the pilots the disadvantages but not the advantages in terms of negotiation and mediation, et cetera, I think is something that we will probably want to look at on this Subcommittee, and rectify. And we have had representatives, by the way, of Pilots Association, the Flight Attendants Association, and the Mechanics Union, the Air Traffic Controllers Association, even the attorneys for the FAA come before this Subcommittee and talk about the difficulty they have had in the last 8 years working with the FAA during that time. I trust and hope that this year we will see a new management that will be working in a more cooperative manner with all of you and your colleagues.

Captain Sullenberger, based on your experience, are there any aircraft design issues that could be reexamined perhaps to make water landings safer or more feasible?

Mr. SULLENBERGER. Yes, Congressman. There are many aircraft that fly domestically that are not required to have life vests on board, or life rafts, and instead rely upon seat cushions. Had we had one of those airplanes and not an airplane equipped for over water use, this would have been a much more challenging situation.

Mr. HALL. Thank you. And I assume based on the conversations here, and other ones you probably already had, that there will be at least a regulatory or perhaps an airline decision to routinely instruct passengers not to open the aft decks. That is in the case of a water landing.

And, Captain Skiles, in your testimony—or in U.S. Airways testimony, it states that you performed the dual engine failure emergency checklist in an attempt to restore thrust to the engines. Could you take us through some of the items on that checklist?

Mr. SKILES. There are a number of items you have to go through. It is actually designed more for doing at high altitude. If you just had a dual flameout for whatever reason, maybe you flew through volcanic ash or you had a fuel interruption. So it is actually very long, very lengthy, and of course, given the time frame, we were only able to get about to the bottom of the first page. But the items that we did accomplish all basically to ensure that we had elec-

trical and hydraulic power to the aircraft even while we are in a glide. Actually, we have an engine master switch which resets some of the computers. It is a lot like your computer at home. When it starts to act up, you reboot it. That is essentially what you are doing there. You are trying to reboot the engine because it is actually controlled by computers.

But that is about as far as we got before we actually performed the ditching.

Mr. HALL. Have either you or Captain Sullenberger been in the cockpit of flights that had bird strikes previously that were survivable?

Mr. SKILES. Well, a bird strike is rare, but it is not a particularly unusual circumstance. I would imagine that just about any pilot that has flown for any length of time has encountered bird strikes. But normally it is a seagull or small bird that maybe doesn't even dent the air frame. It might just—the mechanic might just come out and clean the blood off the nose. That is normally the kind of bird strikes that you have.

Mr. HALL. But geese in both engines are unlikely to leave the turbines functioning.

Mr. SKILES. That is something for the NTSB to determine in their investigation. But it is certainly a bigger bird than I have ever hit before.

Mr. HALL. Thank you, once again, and congratulations. The country is very grateful to you all. I yield back.

Mr. COSTELLO. The Chair thanks the gentleman, and now recognizes the gentleman from Michigan, Dr. Ehlers.

Mr. EHLERS. Thank you, Mr. Chairman. The first question, I assume you get training on how to ditch an airplane. Is that correct? Is that in a simulator? Was it helpful to you? I assume you got it and I assume it was helpful.

Mr. SULLENBERGER. The pilots and flight attendants are taught in ditching. And we do have a procedure in our manuals to follow. What was unique about this situation were the many things we had to confront, the many problems in such a short period of time. But I think ditching would be a difficult thing to practice in the current level of simulation that is available to us in the pilot flight simulators.

Mr. EHLERS. Oh, really. Does it describe to you what angle you should try to hit the water at?

Mr. SULLENBERGER. There is guidance on those kind of parameters, yes.

Mr. EHLERS. So you are well-trained on that as well. You mentioned the problem with the airlines. The labor agreement and so forth. And Congress doesn't normally like to get in the middle of labor management battles, but it has always seemed to me particularly inappropriate to have the airline personnel represented under a law that is designed for railroads. Do you think your union would be in favor or in support of attempting to write a specific law for aviation, just as many, many years ago a specific law for railroads was written? You were just stuck in there because railroads move people, planes move people. Therefore, you are both in transportation. It didn't make sense to me. What are your comments on that?

Mr. SULLENBERGER. What we need is a level playing field. What we need is an impetus for both sides to negotiate in good faith in a reasonable timetable. My concern is for the safety and the integrity of the air travel system. That we continue to be able to attract and to keep highly experienced, highly qualified people.

Mr. EHLERS. Part of the problem—in fact, I think a major part of the problem nowadays is the sorry state of the airlines. And we had a small meeting with the CEOs of the major airlines a few months ago and I said, I just don't understand. I mean, your planes are so full that I now have to make reservations 2 and 3 weeks in advance to get the flights I want. And every plane I am in is filled. Gas prices or fuel prices are back down. And you are still losing money.

So there is something wrong with the business model that says you are as busy as you can be, and you should be making money. And you are losing money. I really think that is a good share of the problem. That given the present state of competition, or lack of competition because of restrictions on the airlines. If they don't get a better business model, if they are not able to make sufficient funds, that is going to reflect on your salaries because airlines can't give you salaries that they can't afford to pay.

Do you have any words of wisdom in how you think the airlines should run their business? Not so much the business aspect of it, but what can they do to be more competitive and to make money, which is their principal objective?

Mr. SULLENBERGER. I can only give testimony from my direct personal experience. However, I have in this airline industry, I have 29 years of direct personal experience, and it is the direct personal experience not only of myself but of my family. As I said in my remarks, my decision to remain in this profession that I have loved and had a passion for my entire working life has come at a great kind of financial cost for me and my family.

What I would say in answer to your question is that to those who say that they are paying market wages because they still fill the pilot seats, that if these trends continue, we probably will find people to do this job. It just won't be the same ones doing it now.

Mr. EHLERS. I think that highlights the problem. I am concerned, as you expressed the concern earlier, about the younger, inexperienced pilots. And I remember they have to start somewhere. But I fly, because we fly so much in our work, I fly on a number of planes that are piloted by quite young people. I sometimes joke that it looks like they barely got out of high school.

I really want them to have a job, but I do get a little nervous about flying with someone who has that much experience. And the Buffalo Continental experience illustrates that. It is too early to tell exactly what happened, but it does look as if the pilot may have gotten rattled, and forgot.

When I learned to fly, one thing I never forgot, the first thing you always do is fly the airplane. And it appears he may have lost that in the concern about the icing. I hope it is not—I don't want to blame the pilot. But if that is true, that is a good example of how lack of experience could result in a disaster situation.

I don't ask you to comment on that, but this is my editorializing. We really have to have adequate training and high standards and,

above all, they have to remember how to fly the airplane, no matter what happens.

The last question is: Is there something we can do about the bird instead of just detecting them. I have noted, for example, I fly out of National a lot very frequently, and I am driving down there I see the Canadian geese eating grass in the park at the end of the runway. That, to me, is a highly dangerous situation. In your pilot circles are you talking about any solution to the bird problem?

Mr. SULLENBERGER. Many of the warnings that we get now about bird activity are routine, are general. They are not specific. I look forward to the industry as a whole working together with technical experts to find ways to detect and to give pilots more specific warnings about specific groups of birds at specific areas.

The other issue is some birds are resident, some are migratory. As Jeff has testified, the migratory birds can be anywhere. They may be large.

As to what happened in our experience, I think it is reasonable for those in the industry to reevaluate the engine certification standards which currently require that during certification testing only an engine be capable of sustaining an impact of a single 4-pound bird and not producing useful thrust but simply not having an uncontained failure or catching on fire.

Mr. EHLERS. Okay. Good point. In my area, we worry more about deer strikes than bird strikes. But that is perhaps a little unusual.

One last comment to the air traffic control specialist. I listened several times to the entire transcript of what happened, and you did a very commendable job. It was interesting to me to hear. You sounded totally unflappable. And I was impressed by the way you handled all the other planes in between your calls to this flight. And so I commend you for that.

Mr. HARTEN. Thank you very much.

Mr. COSTELLO. The Chair thanks the gentleman from Michigan, and now recognizes the gentleman from New York, Mr. McMahon.

Mr. MCMAHON. Thank you, Mr. Chairman. I echo the sentiments of my colleagues, and thank you for putting together this fine hearing. Again, thank you for coming and providing your insights.

I guess I take from this hearing two grave concerns. Really one is the overall condition of the airline industry itself and the notion that we can lose people who are so experienced. And then the issue on the birds itself.

Let's talk about the birds first because I know that there was also the case in Louisiana where a helicopter recently went down—I think it was in Louisiana—because of the impact with the birds. How serious is this problem, in your opinion, Captain Sullenberger?

Mr. SULLENBERGER. As Jeff stated, anyone who has been in the aviation business for a while has had a bird strike. But, typically, they are a single bird, a small bird, that strikes the airplane in a noncritical area, and often does no damage. This was a very different situation. This was atypical, but the risk needs to be adequately assessed.

Mr. MCMAHON. Was it atypical, and we are not bird experts here, but just from your visual observations, do they normally

avoid the airplane or was this unusual because there was contact with such a large flock?

Mr. SULLENBERGER. As Jeff said, I think what made this unusual is the fact that our flight path intersected the birds' flight path and that there were so many large birds that happened to strike the entire aircraft, including both engines.

Mr. MCMAHON. Okay. And on the industry itself, it is very alarming. And I really thank you, all of you, for coming in and sort of taking a very public stand on this very important issue. Do you see, because I know you work as a consultant as well—how imminent do you think the problem is? Is it critical today? Do we have the level of experienced piloting and staffing for our airplanes today, and is this a problem that will come down the road? Or is it at a critical mass now?

Mr. SKILES. The first thing, I think it was critical 5 years ago. I think if you look at the state of the airline industry today, it needs to be rebuilt immediately. It is not something that is going to happen down the road. I mean, certainly it will get worse as experienced pilots retire. But it is something that is occurring right now, today.

Mr. MCMAHON. And you both mentioned in your testimony that the deterioration began right after 2001, 9/11. Is that because of the dramatic loss in air traffic volume at that time and the impact on the industry, or were there other factors?

Mr. SULLENBERGER. I think this began earlier. I think it really began in 1978 with the deregulation of the airlines. That set the stage for all of us to follow. Certainly, it has been greatly exacerbated by the perfect storm of events since September 11. SARS, the economic downturns, the bankruptcies, the mergers. The bankruptcies, I think, were used by some as a fishing expedition to get what they could not get in normal times.

Mr. MCMAHON. Again, thank you all very much for what you have done and coming here today and presenting your testimony. Thank you.

Mr. COSTELLO. The Chair thanks the gentleman, and now recognizes the gentleman from Tennessee, the former Chairman of this Subcommittee, Mr. Duncan.

Mr. DUNCAN. Thank you very much, Mr. Chairman, and thank you for calling this hearing. I don't intend to take much time.

I do want to join with my other colleagues and commend the crew. And I happen to have had three constituents from my district in east Tennessee who were on the plane. And there was a very lengthy article about the two women from my district in this past Sunday's Knoxville News Sentinel. One woman was on the very last row and one woman was on the 13th row. That article brought home to me how scary this event was even after you had ditched because they described waist high water and some problems in attempting to get off the airplane.

So certainly you all did a great job. And, Captain Sullenberger, they even had an article several weeks ago about a distant cousin of yours from east Tennessee. So maybe a lot of people are claiming relationship to you now. I don't know.

Mr. SULLENBERGER. There is a branch of our family that was in Tennessee, and I have been reacquainted with some distant relatives whom I had not seen since a very early age.

Mr. DUNCAN. Well, I was going to ask what the odds were of something like this happening. Again, Mr. Petri covered that. And First Officer Skiles said it was just a real fluke. I didn't know whether this was something that was a billion to 1 or once in 500 years or whatever. Apparently, it was extremely, extremely unusual. I do wonder.

We have been given these statistics about 7,500 bird strikes reported in 2007, and the number since 1990. Is this a growing problem, in your minds, or has this been going on pretty much at the level that it is at now, and are there any airports where it is worse than others?

Mr. SKILES. One of the reasons that you are seeing that it appears to be a growing problem is the reporting requirements for bird strikes have increased dramatically just in recent years. Last week though, I did actually tour my local airport. And the airport manager took me around. And I had no idea what they actually have to go through to combat birds and bird strikes on their airport.

I am no expert on it. You are certainly going to have experts who are going to testify. But, in many ways, the airports are somewhat hamstrung by a lot of regulations; environmental regulations, for instance, that prevent them from handling these specific instances.

For instance, the airport manager where I live, they extended the runway. Where they extended it happened to be in a little bit of a marshy area. And they were required by Federal regulations to actually recreate another wetland right next to one of the runways because they had to recreate it on their property. And, of course, wetlands actually attract birds.

It is a much more difficult problem too because every bird species seems to have their own thing that they don't like. For instance, some don't like sound. But, for instance, seagulls, they don't care about sound. The little propane cannons that they use at airports don't affect them at all. But what apparently affects seagulls mostly is if you shoot one of them, because if they see a dead seagull, they disappear.

And, in some areas of the country, for instance, I believe California was the one that the airport manager mentioned where I live, it is actually illegal to shoot any kind of bird. They have to either trap them and take them someplace else or use some other sort of mitigation techniques.

So I am sure you are going to get testimony on that. But perhaps some of the rules do need to be refined around airports to give them more latitude.

Mr. DUNCAN. So it is not a one-size-fits-all situation then. Apparently some of the environmental rules and regulations need to be looked at in regard to this situation. Since this has happened and you have heard all that you have heard about this, do most of you feel that most of the airports in the country are doing everything they can to combat this, or do you think this is something that they need to do a lot more about?

Mr. SULLENBERGER. I think one thing is that most airports in this country are locally controlled and operated. There are, of course, Federal standards. But it is really up to each individual airport operator to determine whether or not and to what extent and how they will control the birds that happen to be in that particular area.

Mr. DUNCAN. All right. Thank you very much, Mr. Chairman.

Mr. COSTELLO. The Chair thanks the gentleman, and now recognizes the gentleman from Ohio, Mr. Boccieri.

Mr. BOCCIERI. Thank you, Mr. Chairman. Thank you for hosting this Committee. Let me just say to this panel who has assembled here how proud I am of you. I am just in awe of the professionalism and conduct that you have displayed both in the cockpit and in the air traffic control tower to what you have done in the events that have led after.

Captain Sullenberger, you and I share some things in common. I am an Air Force-trained pilot. I have 15 years in the military, 13 in aviation, and they engrained from the beginning, Maintain aircraft control, analyze the situation, take appropriate action. I think what you and your crew did was exemplary. So I just wanted to tell you how proud I am. And the poise that you showed in the tower I think is exemplary as well.

I have many of my buddies who fly for the airlines, and they speak the same language that you do about the uncertainty, both as a career, and the uncertainty of whether their job is going to be there. And it is just tragic because I have flown all over the world and I can tell you that the professionalism that we have before this panel, Mr. Chairman, and what we have in our control towers, is exemplary. I have been around the world. I can speak to that as a C-130 pilot.

In our research here they tell us that research and NTSB recommendations have led to airlines designed to be more resilient to disasters. I know on the Airbus that they have a ditching switch. And from your testimony here, you suggested that you were only able because of time and altitude and the likelihood of a ditching that you were only able to get partly through the dual engine failure checklist.

My question is: When this airplane landed in the water and you weren't able to perform that checklist, did you have the situational awareness to close the ditching switch that closes all the holds below the waterline? Can you speak to how that transpired?

Mr. SULLENBERGER. The answer is there was not time. We did not get that far in the checklist. The bottom line is, in this case it was irrelevant because the ditching push button, while theoretically it is a good idea, and I understand why the engineers and designers included it in the airplane, it only is designed to close some small openings that are normally open in the bottom of the airplane.

Upon first contact with the water, larger openings occurred in the airplane much larger than any of the vents that the ditching push button was designed to close. It wouldn't have mattered even if we had gotten through it in this case.

Mr. BOCCIERI. Do you think the design of the Airbus lent itself to staying afloat for as long as it did?

Mr. SULLENBERGER. I cannot speak to that. I would hesitate to speculate. I can only say that we are very happy that it stayed afloat as long as it did.

Mr. BOCCIERI. We are too. I can tell you that your passengers are very proud of the efforts that you gave there. I want to follow up with one other thing here. The industry as a whole is going through a flux and, with the raising of the retirement age to 65 now, and the quality of the training that you go through, it is important that we understand that at some point those Baby Boomers who are flying right now are not going to be there. And is it appropriate to require more training with simulation?

I remember going through our simulator flights and experiencing every aircraft mechanical emergency that you can ever experience. Is the training adequate, from your perspective as a flight check pilot, to what we give to those with lower number of hours?

Mr. SULLENBERGER. It is important as one generation gives up the profession and hands it over to the next that the body of knowledge of what we do and why we do it continues. There must be a continuity. You have to know the history, you have to know about the seminal accidents that Chairman Oberstar talked about, and others, that are really the reasons for much of what we do. You have to know not just what to do, but why we do it, so that when you are in a time critical situation and there isn't time to use every checklist or consult every reference, that you know what clearly you must do. You have a very clear idea about what your priorities are and, in the limited time you have available to you, what steps you must take.

Mr. BOCCIERI. Thank you. I will close by saying that in our reports also they say that the flight attendants and cabin crew are trained within 90 seconds to evacuate the aircraft. I know those seconds probably seemed longer than that. But you truly were able to help this be a success story. So I want to thank you again.

I am proud of what you stand for, what you have done both in the cockpit and outside of it. I think you have been extremely professional and humble. And, thank you.

I yield back my time, Mr. Chairman.

Mr. COSTELLO. The Chair thanks the gentleman, and now recognizes the gentleman from Pennsylvania, Mr. Dent.

Mr. DENT. Thank you, Mr. Chairman. I too just want to express my congratulations to all of you and collective gratitude on behalf of this Committee and the American people for what you did on that day.

If you will indulge me on a personal moment. I took a great deal, almost a vicarious thrill in what you all did because my late uncle, for whom I was named, was a senior captain at United Airlines. His name was Charles C. Dent.

And he was the first pilot to land a plane, a commercial plane, on experimental foam in the 1950's during a crisis. It was quite an ordeal for him, as was his crew, at the time. He had to jettison his fuel over the Pacific Ocean. Took him about an hour or two to land and do a belly landing because the landing gear wouldn't come down. He did it successfully.

He was momentarily famous and the actor Jimmy Stewart actually did a tape recording of this whole event. It is on video. I have

seen it. I would be happy to share it with the Committee at some point. It was really quite a thrill for him. He passed away a few years ago. And it is ironic a Dent was on the plane too on this occasion.

I just wanted to share that with you. It just gave me a real thrill to see what you were able to do, all of you were able to do, with that belly landing on the Hudson River. It made me think of his experience back in the 1950's. He was asked at the time by the tower, How much foam do you want down on the runway? Nobody had ever done this before with passengers. And he said, Well, whatever is appropriate for occasion. So that is what happened. Everybody walked off.

My only question for Captain Sullenberger is this: When he got off the plane, the Chairman of United Airlines handed him a $5,000 check in the 1950's, which was a lot of money back then. Did anybody hand you a check, or any of the crew?

Mr. SULLENBERGER. Interestingly, US Airways gave everyone, passengers and crew, $5,000 very shortly after the incident to replace personal items lost. And we appreciate that.

Mr. DENT. Well, he got $5,000 just for landing the plane. So I just wanted to share that with you. But, thank you again for all that you have done. Again, it was just a remarkable experience you probably would rather not have participated in but, nevertheless, just an extraordinary occasion and achievement and you should all be very proud of what you did.

Thank you. I yield back my time.

Mr. COSTELLO. The Chair recognizes the gentleman, and now recognizes the gentleman from Missouri, Mr. Carnahan.

Mr. CARNAHAN. Thank you, Mr. Chairman, and all of you. Again, I just want to pile on additional thanks, and just really remarkable actions that we have heard about today and witnessed in the media. Your discussion about the team approach certainly is evident throughout the description we hear. But, Captain Sullenberger, you were certainly the captain of this team, and I think your calm and cool hand in this situation has certainly emanated throughout your team.

I, again, just want to congratulate all of you. This really was a testament to your training, a model of professionalism, and for those 150 people that were on that plane, you certainly made a difference in their lives, and all of the families of those folks, yours included, certainly is remarkable.

I want to ask Captain Sullenberger, if you were talking to a group of pilots here today, what would be your advice in terms of lessons learned from this flight; anything that could be done better, different, or continued, in terms of your training for instances like this.

Mr. SULLENBERGER. Well, I wouldn't presume to talk to my colleagues in an instructional fashion. I think I would just share my experiences and just say that flying has been a passion for me literally since I was 5 years old. I have always paid attention, I have always devoted a great deal of care to it. It matters to me. And it has been a source of great satisfaction for me to continue to improve and try to excel.

I would also say that I feel a great obligation, since we have been chosen by circumstances temporarily to represent the profession, to represent them in a way that will not disappoint them.

Mr. CARNAHAN. I don't think you have disappointed anyone. I think certainly anyone who is in your profession, and certainly a new generation of people thinking about going into the profession, certainly will be inspired by your actions. Thank you all very much.

Mr. COSTELLO. The Chair thanks the gentleman.

Two quick questions. Captain Sullenberger, you heard me mention in my opening statement about the technology that is now being used at Seattle-Tacoma International Airport in conjunction with the University of Illinois, and they are using an enhanced radar system to better deal with detection. Are you familiar with that technology?

Mr. SULLENBERGER. I had not heard about that until I read about it after the event of January 15.

Mr. COSTELLO. Very good.

Mr. Harten, let me ask you. Obviously, it is very clear that the experience that all of you, the entire crew and you as an air traffic control specialist, experience paid off. I would hate to think, and I said this in an earlier hearing, what the outcome would have been had someone with an entry level experience as First Officer Skiles said earlier about 300 hours versus 3,000 hours of experience. And the same thing with the flight attendants. I would hate to think of what may have happened in this situation with a pilot and first officer and flight attendants that were new to the job, so to speak.

You heard Mr. Mica mention earlier that there have been concerns about the rapid retirement of the most experienced air traffic controllers. We have had hearings on it. We have talked about fatigue as a factor, we talked about—I have said I was in a tower recently in Florida just a few months ago and, I forget how many, but I think there were, out of the 10 controllers there, the most experienced one at the time when I was there had 1 year of experience. The rest of them had less than a year.

I just want you, if you would, to explain from that day your position on what experience meant to you versus someone who may have been in the tower for the first day, or less than a year.

Mr. HARTEN. In that case, experience was everything. I mean, I have 10 years of working busy traffic. And just the experience of working that traffic for so long gives me the tools to be able to react to a situation the way I did. You can't substitute experience in a case like that.

Mr. COSTELLO. The Chair recognizes the Ranking Member, Mr. Petri, for a question.

Mr. PETRI. I forgot to ask this of Captain Sullenberger. The news stories indicated, and I guess other reports, that when this was all over, before leaving, you walked up and down the aisle a couple of times to make sure that everything was in order. Is that part of protocol? What was going through your mind? Why did you do that?

Mr. SULLENBERGER. I had the time. And I could leave no possibility that there would be anybody left behind.

Mr. PETRI. We thank you for setting a fine example. Thank you all.

Mr. COSTELLO. Let me, again, thank all of you on our first panel for your testimony, for being here today. Obviously, I won't repeat what has been said many times. But we thank you all for what you did and how you reacted superbly. Your, obviously, training, your experience paid off not only for you but for the 150 people that were on that flight that day.

So we are very proud of you and we appreciate everything that you have done and that you continue to do to keep the flying public safe every day.

That concludes the testimony from the first panel. We appreciate your being here, and your entire statements will be entered into the record. Thank you very much.

The Chair now will ask the second panel to come forward. And I will introduce the panel as the first panel is leaving. If you would please take your Chairs as soon as you can.

The Honorable Robert Sumwalt, III, Member of the National Transportation Safety Board, accompanied by Mr. Tom Haueter, the Director of Office of Aviation Safety with the NTSB; Ms. Margaret Gilligan, Associate Administrator for Aviation Safety with the FAA; Captain John Carey, Chairman, Accident and Investigation Committee, U.S. Air Line Pilots Association; Ms. Candace Kolander, Coordinator, Air Safety, Health, and Security, Association of Flight Attendants-CWA, AFL-CIO; Captain John Prater, President of the Air Line Pilots Association, International; Mr. Mark Reis, Managing Director, Seattle-Tacoma International Airport, Board Member, Airports Council International of North America; Mr. John Ostrom, Chairman, Bird Strike Committee-USA, Manager, Airside Operations, Minneapolis-St. Paul International Airport, accompanied by Dr. Richard Dolbeer.

STATEMENT OF HON. ROBERT SUMWALT, III, MEMBER, NATIONAL TRANSPORTATION SAFETY BOARD, ACCOMPANIED BY TOM HAUETER, DIRECTOR, OFFICE OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD; MARGARET GILLIGAN, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION; CAPTAIN JOHN CAREY, CHAIRMAN, ACCIDENT AND INVESTIGATION COMMITTEE, U.S. AIR LINE PILOTS ASSOCIATION; CANDACE KOLANDER, COORDINATOR, AIR SAFETY, HEALTH, AND SECURITY, ASSOCIATION OF FLIGHT ATTENDANTS-CWA, AFL-CIO; CAPTAIN JOHN PRATER, PRESIDENT, AIR LINE PILOTS ASSOCIATION, INTERNATIONAL; MARK REIS, MANAGING DIRECTOR, SEATTLE-TACOMA INTERNATIONAL AIRPORT, BOARD MEMBER, AIRPORTS COUNCIL INTERNATIONAL OF NORTH AMERICA; JOHN OSTROM, CHAIRMAN, BIRD STRIKE COMMITTEE-USA, MANAGER, AIRSIDE OPERATIONS, MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT, ACCOMPANIED BY RICHARD DOLBEER, CHAIRMAN, (1997-2008) BIRD STRIKE COMMITTEE-USA

Mr. COSTELLO. The Chair will now recognize the second panel for their testimony. Again, we appreciate you being here for this important hearing.

We look forward to hearing your testimony. We will operate under the 5-minute rule, which means that your entire statement will be entered into the record. We would ask that each of you try and summarize your testimony within 5 minutes or less.

The Chair now recognizes Mr. Robert Sumwalt, III, who is a member of the National Transportation Safety Board.

Mr. SUMWALT. Well, it is still morning. Good morning, Chairman Costello, Ranking Member Petri, and Members of the Subcommittee. Thank you for the opportunity to present testimony on behalf of the NTSB. I would like to give a brief summary of the Safety Board's investigative activities thus far of the US Airways Flight 1549 accident.

The investigation is still in its early stages, and we are continuing to gather factual information regarding the circumstances of this accident.

Our goal is to learn from this accident so that we can prevent future accidents, and to further improve aviation safety. Information from the flight data recorder revealed that the elapsed time from takeoff to the bird strikes was a little over 1-1/2 minutes, and the time from the bird strikes to touchdown in the water was about 3-1/2 minutes. The bird strikes occurred at an altitude of about 2,750 feet mean sea level. Additionally, the flight data recorder revealed no anomalies in the operation of the two CFM56 engines until the time of the bird strikes.

Under the Safety Board's supervision, the engines were disassembled at the CFM manufacturing facility in Cincinnati. Bird remains, including feathers, were found in both engines; and with the assistance of the U.S. Department of Agriculture and the Smithsonian Institution, a determination was made that the bird remains were that of the Canada goose.

In spite of positive determination of species, we may never be able to determine the precise number of birds ingested. Most often, engine bird ingestion, does not result in the loss of thrust. Even less likely are multiple engine failures.

Our investigation so far has uncovered issues that complicated the evacuation effort. For example, the cargo compartment structure had been pushed up through the rear floor of the airplane, and the aft pressure bulkhead of the fuselage was compromised, thus allowing water to enter the rear cabin area. This caused the fuselage to float in a tail-down attitude, which precluded the use of the two aft slide rafts.

As part of the continuing investigation, the Safety Board will conduct a fact-finding public hearing of this accident. Topic areas to be examined will include turbine engine bird ingestion capability, the joint JAA and FAA certification of the Airbus A320 regarding water landings, the effectiveness of bird detection mitigation efforts at or near airports, and the current state of training at airlines regarding ditching scenarios.

In addition to the US Airways accident, the Safety Board is currently investigating or assisting in the investigation of three accidents where bird strikes may have occurred. For example, in January of this year, a Sikorsky S-76 helicopter crashed near Morgan City, Louisiana. That accident claimed eight lives and caused one

serious injury. At this time, the Safety Board's investigation is focusing on a possible bird strike.

The Board is also assisting the Italian government in their investigation of a Ryanair Boeing B-737-800 that crashed in Italy in November of 2008. Fortunately, there were no fatalities or injuries. Additionally, the Safety Board is investigating the crash of a Cessna Citation that struck birds near Oklahoma City on March 4th of last year, resulting in five fatalities.

Since 1973, the Safety Board has issued 32 recommendations to the FAA and other government agencies regarding bird strikes, bird ingestion by aircraft engines, and bird hazard mitigation. I want to underscore that the Safety Board is very concerned with the issue of bird strikes and related hazards. We are eager to learn more about these issues in our efforts to help improve the safety of air transportation. From a personal perspective, that of a former airline captain at US Airways with more than 32 years of flying experience, and one who flew for about 1,300 hours in the Airbus aircraft, I am extremely interested in seeing that the Safety Board follows through with a thorough and comprehensive investigation.

Mr. Chairman, this completes my testimony, and I will be glad to answer questions at the appropriate time.

Mr. COSTELLO. The Chair thanks you for your testimony, and now recognizes Mr. Haueter.

Okay. The Chair now recognizes Ms. Margaret Gilligan.

Ms. GILLIGAN. Thank you, Chairman Costello, Congressman Petri, and Members of the Subcommittee. We thank you for including FAA in the discussion of the events surrounding US Airways Flight 1549's emergency landing in the Hudson River.

The circumstances of Flight 1549 were simply unprecedented, and we, just as the rest of the world, are awed by the quick thinking and consummate professionalism of the entire crew, as well as the air traffic controllers involved. But before going on, I must note that as we celebrate the outcome of Flight 1549, Mr. Chairman, as you stated, we also mourn the tragic loss of life on Colgan Air Flight 3407 in Buffalo. We are fully supporting the ongoing NTSB investigation, and I want to assure you we will keep you and your staff posted on our progress.

NTSB is also still investigating Flight 1549, so I just want to touch on FAA's efforts in three areas: first, our work with airports to reduce the probability of bird strikes; our standard for aircraft design to increase survivability in crashes; and our requirements for flight crew training when encountering emergency situations.

Our statistics on bird strikes indicate that the closer the aircraft is to the runway, the higher the risk of a bird strike. About 73 percent of all reported strikes occur at the airport, from the airport surface up to 500 feet above the ground. As you have just heard from Member Sumwalt, Flight 1549 had reached an altitude of about 2,700 feet when it encountered a flock of Canada geese. Only about 5 percent of reported strikes occur between 2,000 and 3,000 feet.

Since the data indicate the greatest risks for strikes occur at the airport, the FAA has focused its bird strike mitigation efforts in that area. We require commercial service airports to conduct wildlife hazard assessment and, if necessary, prepare a Wildlife Hazard

Management Plan to reduce the possibility of bird strikes in and around the airports. We work closely with the U.S. Department of Agriculture and the Smithsonian to help airports with wildlife mitigation efforts.

For the aircraft, we have design requirements for flight into a flock of birds, for loss of engine power, and for emergency landings on land and in the water. What occurred on Flight 1549 indicates that in this emergency situation, all of our safety standards were met. The engines reacted exactly as was intended: They shut down, they remained intact, they did not shed any parts that might have damaged the aircraft or injured any of the passengers, they remained on the wing. After ditching, the aircraft floated as it was required, the exits remained available, and there was sufficient time for successful evacuation of everyone on board.

In addition to our design requirements, we require airlines to develop and train on ditching procedures. Flight training includes reviewing the ditching checklist to acquaint crews with this rarely used procedure. And flight attendant training includes a hands-on drill to ensure the proper use of emergency flotation equipment. At US Air, they conduct initial flight attendant training in a pool to assure experience with rafts and flotation devices. All these efforts contributed to the extraordinary acts of this incredible crew.

Captain Sullenberger's training, as noted by Congressman McMahon, enabled him to control the aircraft skillfully. First Officer Skiles's training, as Chairman Oberstar pointed out, assured that they worked as a team. And the incredible professionalism of Flight Attendants Welsh, Dent and Dail, made sure that everyone got out. But the fact remains that for all the training and technological advances we might make, the human element is where it can all fail or where it can astonish all of us, as it did in this case.

Equally admirable is the work of Patrick Harten, the air traffic controller who communicated with Captain Sullenberger during those harrowing moments. He and the team at the New York TRACON and LaGuardia tower were a crucial part of this incredible story; and joining with controllers at the Teterboro tower, they did a great job of coordinating the emergency response notifications.

This event proves what safety professionals in aviation have always known: It takes all of us—aircraft designers, airlines, pilots, flight attendants, airport managers, and yes, the Federal Government—to accomplish our outstanding safety record.

Mr. Chairman, Members of the Committee, that concludes my remarks. I will be happy to answer any questions.

Mr. COSTELLO. Thank you, Ms. Gilligan.

And now the Chair recognizes Captain Carey.

Mr. CAREY. Chairman Costello, Chairman Oberstar, Ranking Members Mica and Petri and Members of the Committee, thank you for the opportunity to testify before you this afternoon.

Most importantly, I would like to acknowledge the crew of Flight 1549, whose bravery and heroics combined with exceptional airmanship in saving the lives of the passengers. This has given our country a chance to proudly celebrate their bold actions.

They have also given us the opportunity to reflect on the current state of aviation safety. Because we are party to the ongoing NTSB

investigation, we will not comment on specific areas that would compromise the investigation.

The Safety Board, in our opinion, has put a very appropriate emphasis on this investigation, and we are pleased to be a party. The reason we are a party and the reason we are here today is to work toward preventing future accidents and to promote aviation safety.

Airline pilots have a long tradition of safety advocacy. Captain Sullenberger is a prime example. It is one thing to talk about being a safety advocate, but airline pilots walk the walk. Pilot safety volunteers work tirelessly, while dues-paying members reach into their pockets each month to support these ongoing safety activities. Even now, while working under bankruptcy era contracts, our pilots continue to fund these all-important safety projects. Each and every budget contains significant funding for safety. Nothing could be more gratifying than to see our colleagues from other flight crew unions here today.

On the afternoon of January 15th, every airline pilot in the world put themselves in the cockpit of Flight 1549. We have all thought the ultimate: What would I do if I was at the controls that day? We all share the feelings.

And in a very real way, Jeff and Sully have united us. Their professionalism in the cockpit, the poise that they have displayed during and after the event, and their personal demeanor has been an inspiration to every pilot.

In all of the hangar flying that has taken place since this event, nobody has second-guessed the actions of our crew. Not many would predict a similar outcome had they been faced with the same dilemma, which is extremely unprecedented. Airline pilots are their own worst critics; however, this case is one where there was no training, and almost all agree that a successful outcome would be, at best, a long shot.

Many things went into the successful outcome of Flight 1549. Clearly, we had the vast experience of the flight deck that day. What is also evident is that the pilots and flight attendants, as individuals, are among the best and the brightest that our aviation society has to offer. In addition, our industry has built on many core safety principles, which continue to serve us well. This crew has embraced these principles, and successfully demonstrated them during Flight 1549.

Regarding crew experience, the industry contraction had an unintended positive effect. In our opinion, First Officer Jeffrey Skiles is a primary example. Having been with the airline in excess of 20 years and previously served as a captain, his presence on the flight deck significantly contributed to the successful outcome of Flight 1549. Due to attrition, however, this will not last. The greatest hope that we have of ensuring experience on the flight deck in the future is to promote and support a thriving airline industry.

A successful airline industry is the most important factor in attracting and retaining qualified pilots. Competitive salaries and benefits are central to attracting and retaining a qualified pilot workforce. And Congress must also step up to ensure that pilot employee pensions are protected. By protecting their pensions, you ensure that new-hire pilots remain in the cockpits of our airliners

andbecome the Captain Sullenbergers of the future. The Akaka amendment will go a long way toward attaining that goal.

When we talk about core safety values, FAA oversight and regulation is critical. FAA leadership in developing regulatory guidance for the implementation of our Safety Management System has stagnated to some extent the advancement of the industry safety agenda. FAA needs to commission an aviation rulemaking committee to push the agenda forward. Although some in the industry have voluntarily begun programs, the standards are not uniform, and the quality can largely be debated. Without a pure SMS standard, such as those developed by the International Civil Aviation Organization, individual elements such as FOQA, ASAP, and AQP and LOSA are all administered differently, thus making airline safety irregular at best.

Talking specifically about issues which may be germane to Flight 1549, bird mitigation seems to be a very elusive problem, especially the farther from the airport and the higher the altitude. Although much has already been done, further funding and study will be necessary to develop additional means for mitigation. An FAA interview of FAR 139 relating to wildlife hazards should be undertaken immediately.

The failure of engines on Flight 1549 should prompt a fresh look at engine design and certification standards. Although the investigation is ongoing, it seems clear from the facts in the public domain that we have new data now by which to look at bird ingestion. FAA leadership will also be critical towards this effort.

The evacuation and rescue phase was unprecedented. Although training in ditching is conducted, it has never been tested in this arena. To safely evacuate 155 people in this environment is a miracle in itself. The fact this was all done with two rear exits and two rafts unavailable made the success almost an impossibility.

One thing is clear, the entire crew performed heroically throughout the entire evacuation and rescue. They are true heroes, and should be recognized as such. Additionally, all of those who operated the rescue watercraft and many who performed heroically and unselfishly on the Hudson River that day should also be recognized.

Open questions remain on the survivability of the aircraft. Due to the actions and rapid response of all involved, the sustainability of the aircraft did not become a factor; however, the fact that the aircraft sank to the point where the rear exits and rafts were unusable and did not remain afloat very long after the rescue should be a concern for future accidents. Hopefully, the investigation will shed light on the issues as facts are discovered.

As we further analyze the accident, we should realize our brief 5-minute testimony here today this afternoon has lasted as long as Flight 1549. With a normal takeoff and climb, we should realize how little time our pilots had to analyze the situation, make a critical decision on where to land in one of the most heavily populated areas of the world, all this while attempting to restart failed engines, prepare the aircraft for ditching, communicate with ATC and flight attendants, and prepare the passengers in the cabin.

I would like to reiterate our commitment to enhancing aviation safety as this investigation goes forward, and I want to thank the

Committee once again for the opportunity to testify today. Thank you.

Mr. COSTELLO. Thank you, Captain Carey.

And the Chair now recognizes Ms. Kolander.

Ms. KOLANDER. I want to thank the Committee for giving AFA the opportunity to testify today and giving our members from US Airways Flight 1549 the opportunity to tell their story. They are a true testament to the strength and resilience of all flight attendants that love this profession and take seriously our role as aviation safety professionals.

At the same time, our thoughts and prayers go out to our fellow flight attendants and everyone affected by the Continental Connection Colgan Airways crash outside of Buffalo, New York. We are sadly reminded by this accident that our chosen career does pose a daily risk.

For decades, AFA has been at the forefront of calling for and helping develop improvements that have been made to ensure that our workplace, the passenger aircraft cabin, is as safe as it can be. We have been an integral part in accident investigations going back to the mid-1950s and played a key role in developing recommendations from these investigations.

Over the years, we have seen a number of changes in design standards that have improved survivability and decreased injuries. Among them are less flammable cabin materials, floor-level emergency escape lights, and requirements for 16-g seats in all newly manufactured aircraft. My written testimony provides greater detail on these and other improvements, but many more still need to be done and need to be addressed, such as aircraft air quality and evacuation certification standards.

The evacuation of Flight 1549 reminded everyone in the world in stunning fashion just exactly what the role and purpose of flight attendants are: in-flight safety professionals. On that day, each member of this senior crew did their jobs as trained; had they not done so, we would be talking about a completely different outcome.

The aircraft landed at the right angle and was evacuated quickly, with minimal injuries. There were also a number of fortunate circumstances that day, such as the weather conditions, readily available watercraft to provide assistance, and time of day that lined up perfectly for a successful outcome.

But we cannot always rely on luck. For that reason, we build redundant safety systems into the aircraft design to address potential failures, that is, if one of the safety protections fails, another layer of protections in the aircraft design will assist in mitigating continued failure or damage.

When things start to fail in the cabin, we are left to rely solely on our training. Just because the crew did their jobs successfully in this case doesn't mean that we should stop building in additional operational layers in the flight attendant world to enhance safety.

One of those layers is training. Training is crucial, just as crucial as redundant systems in design, yet we continue to look to enhance design. Why not look to enhance training?

Years of cultural attitudes have often relegated flight attendants to nothing more than servers in the sky in the eyes of some. In fact, airline management is more than willing to spend money to

add more and more customer service and sales-type training for flight attendants, yet at the same time the trend has been to squeeze all the required emergency safety and security training into as little time in the classroom as possible. Flight attendant classroom emergency training hours have been reduced to the bare minimum allowed by the regulations.

Now, we don't disagree with the duties associated with customer service, but our primary role on board that aircraft is safety. I think we can all agree it is more important for a flight attendant to know how to properly use safety equipment than a credit card swiping machine. But we have observed a disturbing trend in reductions in the amount of time spent on required emergency training. Currently, some of the regional airline operators are providing a 2-day recurrent training for their flight attendants.

A regional airline typically has only one or two aircraft types, with similar configurations of the cabin, similar locations of emergency equipment, and similar procedures for emergency evacuation. A major operator, in contrast, has multiple aircraft types and multiple aircraft configurations, and is conducting only a 1-day recurrent training. And sadly enough, we just recently learned that one of our regional airlines is now planning to reduce their 2-day to a 1-day emergency training. That is because the majors are doing it, the regulations allow it, and the FAA approves it.

Training is not our only concern. My written testimony highlights other areas; and in fact, one of those areas is fatigue. Our President, Pat Friend, has on several occasions addressed this Committee on that issue.

In conclusion, we have been fortunate to see an overall decrease in commercial airline accident rates over the last few years, but we cannot rest on our laurels. We cannot stop researching new design standards that could further improve the accident survival rate. In addition, we must continue to evaluate and improve current operational procedures that would further enhance the ability of all crew members to fulfill their duties as safety professionals.

Mr. COSTELLO. Ms. Kolander, we appreciate your testimony.

Now the Chair recognizes Captain Prater.

Mr. PRATER. Good morning, Chairman Costello, Ranking Member Petri. Thank you for inviting ALPA to testify before this Committee.

Before I begin my remarks, I want to express our heartfelt sympathies to the families and friends of those lost so recently in the Continental Connection Colgan Flight 3407 accident. It is ALPA's privilege to support them in their time of need.

Over a span of 78 years, ALPA has been a part of nearly every significant safety and security improvement in the airline industry. Today, we run the largest nongovernmental aviation safety organization in the world, powered by hundreds of professional airline pilots. This morning we will explore the various safety issues associated with this accident, including the value of having well-trained professional men and women in the front seats of our airliners.

It is clear that Captain Sullenberger dedicates his professional life to improving aviation safety, and we are proud to say that ALPA provided him with that safety structure for more than 20 years. Year after year, pilots who have performed routinely under

critical conditions deflect the praise, just as the crew of US Airways Flight 1549 just did. We call it ″doing our jobs.″ But this crew provided the aviation industry with the extraordinarily rare opportunity to analyze a relatively intact airliner that not only successfully landed on water, but also retained enough structural integrity to give all the occupants time to safely evacuate.

We must learn everything we can from this ditching. ALPA urges the FAA, working with the NTSB investigation, to conduct a thorough analysis of the requirements for and capabilities of the various water survival provisions on airliners, from life jackets, which some airliners are removing, to landing in bodies of water other than the ocean, such as the Hudson River.

As for the birds, you have to understand that the potential for bird strikes is something that every pilot is aware of, concerned about, and generally powerless to avoid, especially when faced with an entire flock of Canada geese on takeoff. Aircraft manufacturers have made great strides in designing airplanes to withstand bird strikes. Pilots train for wildlife avoidance. Airport operators administer Wildlife Hazard Management Plans and are testing new technologies that the FAA will develop into an airport Bird Strike Advisory System.

We are trying to do our part, as well, by furthering our pilots' training with educational materials about wildlife avoidance techniques. In fact, ALPAis releasing a publication today which makes a number of recommendations on this issue. We will be sure to share it with all airline pilots, including the 105-member International Federation of Air Line Pilots' Associations.

In the end, however, the most important safety issue that emerged from this accident involves the human element—not the birds, not the airplane. After both engines failed, Captain Sullenberger, First Officer Skiles, and the flight attendants used their training and worked as a team to make split-second life-or-death decisions that literally determined the fate of 155 souls. First Officers Derek Alter with Colgan Air and Susan O'Donnell with American Airlines, both jump-seating on this flight, also assisted in the evacuation. Derek even gave a passenger the shirt off his back. All professionals.

The air traffic controllers calmly described the pilot's emergency landing options at various local airports. The ferry boat pilots and first responders' swift reaction enabled an almost immediate rescue from the frigid waters.

The truth is that these individuals do this job day in and day out, 24-7, 365 days of the year, without recognition. Captain Sullenberger told Katie Couric that the most important words he has heard have been from his peers. He said, I have made them proud, that they feel pride in themselves, a pride in their profession they hadn't felt for many years, sometimes decades. His words stuck with all of us.

See, we know that many of our airline pilots have lost pensions, their wages, medical benefits over the last 8 years. Furloughs, bankruptcies, near bankruptcies further damaged many of our contracts. The toll it has taken on our pilots and on the future of our industry and on its safety and security: You heard it from Captain Sullenberger and his crew earlier today.

What troubles us most is that these conditions have eroded the pilot profession to the point where our union has raised legitimate questions about whether the industry is capable of hiring and retaining the next Captain Sullenberger. While the traveling public might appreciate cheap fares in a downturned economy, they need to know it comes with the hidden fees of losing quality pilots and making it nearly impossible to attract the next generation of pilots to fill the shoes of the crew members before them.

The bottom line is that airline safety depends on many variables, but ultimately a passenger's life is in the hands of a highly qualified, trained, and experienced flight crew.

As the President of the largest pilots' union in the world, I want to ensure that the kids that have been motivated by the actions of this crew and who want to enter aviation have the opportunity to follow in Sully's footsteps and do what we love to do for a decent living. As professional aviators who help keep this industry safe, together with the strong support of Congress and certainly this Committee, we are confident that we can turn their dreams into reality. Our success in this mission is vital to our Nation, our industry, and the safety of the traveling public.

Thank you very much. I would be prepared to take any questions.

Mr. COSTELLO. The Chair thanks you, Captain Prater, and now recognizes Mr. Reis.

Mr. REIS. Mr. Chairman and Ranking Member Petri, thank you for the opportunity to testify today on behalf of Airports Council International. I am the Managing Director of Seattle-Tacoma International Airport and am here today to describe how airports work to reduce the risks of aircraft-wildlife strikes and to highlight the challenges we face in doing so.

The Flight 1549 accident has dramatically highlighted the threat posed by wildlife strikes. The number of these strikes reported to the FAA has more than quadrupled, from 1,759 in 1990 to a record high of 7,666 in 2007. FAA strike data also indicate that most strikes take place at or near airports.

Airports are important partners with the Federal Aviation Administration and the Department of Agriculture's Animal and Plant Inspection Service and Wildlife Services in mitigating the risks that wildlife pose to aircraft operations. The FAA requires commercial service airports to undertake immediate action to alleviate wildlife hazards whenever they are detected.

Airports are also required to have a qualified wildlife biologist conduct a wildlife hazard assessment in the event that an air carrier aircraft ingests wildlife into its engines, is substantially damaged by a wildlife strike, experiences multiple wildlife strikes, or if wildlife were observed in a manner that could cause an aircraft to experience one of those situations.

Often times airports then develop a Wildlife Hazard Management Plan. These plans contain specific actions to minimize or eliminate wildlife hazards through habitat modifications, land use changes, and wildlife population management. The costs of wildlife management programs vary considerably from airport to airport, but some airports spend $250,000 or more per year on their programs. Funds from the Airport Improvement Program can be used

to pay for a portion of the costs associated with habitat modification projects and wildlife management equipment; however, ongoing operating expenses associated with these programs are typically not eligible for Federal funding and are borne by the airports themselves.

At Sea-Tac, we have had an extensive program to manage wildlife hazards in place for over 30 years. Sea-Tac is located in a highly urbanized area of western Washington, about 2 miles east of Puget Sound, and in one of North America's four major migratory bird flyways. Sea-Tac has implemented a number of measures to prevent wildlife strikes. For example, our landscaping includes only plants that do not produce fruits, nuts, or berries. Grass is kept at an optimal height to decrease wildlife use of the airfield for food and cover. We have also developed our own specialized grass mix that is wildlife resistant.

We also actively work to harass and relocate problem species we find on the airport. The airport holds permits issued by the U.S. Fish and Wildlife Service that allows us to harass certain bird species, relocate raptors, and lethally remove individual migratory birds that lose their flight-fright response.

We have incorporated wildlife management considerations into our wetland mitigation efforts and our storm water facility designs. For example, storm water ponds were designed with liners and netting, specifically to exclude wildlife and the aquatic vegetation that attracts it. We have recently created within a few hundred yards of our new runway 60 acres of wetlands that are specifically designed so as not to attract birds.

In cooperation with researchers at the University of Illinois, we are exploring enhanced wildlife monitoring through the use of an avian radar system that was installed in August of 2007. This system acts like a powerful pair of eyes capable of seeing farther and higher than a human observer 24 hours a day. Data from the system is being used to help confirm that hazardous bird activity is not increasing near the airport's storm water ponds and to help identify wildlife trends. However, avian radar is not yet a silver-bullet solution that can be used by pilots and air traffic controllers to avoid birds in real time.

I want to address three key challenges that airports face in our efforts to manage wildlife hazards: off-airport land use, conflicting and overlapping regulations, and funding.

First, local zoning and permitting practices can result in the construction of wildlife attractants near airports. Our aviation system would benefit if airports had stronger mechanisms to control land uses in their vicinity when safety is at stake.

Another issue involves complex and often contradictory Federal, State, and local laws and regulations regarding wildlife management and habitat protection. In some cases, State laws restrict the type of trapping methods that airport officials can use to manage wildlife and the use of lethal removal even when such actions are permitted under Federal law.

In the case of Sacramento International Airport, the risk of criminal prosecution by airport officials resulted in the airport's ceasing certain wildlife removal and harassment activities. Airports

in Florida have encountered a similar situation, and are working with the State legislature to remedy it.

The Clean Water Act and National Environmental Policy Act requirements relating to wetlands can make it difficult, expensive, and time-consuming for airports to modify wildlife-attracting wetlands on and near airports and to reduce wildlife strike risks. Providing simpler, streamlined permitting and environmental review processes when safety is at stake would help airports manage wildlife hazards more consistently with Federal aviation regulations.

Finally, airports, especially smaller airports, need funding to implement and maintain effective wildlife management programs.

Mr. Chairman, thank you for allowing me to share a little about airports' efforts to manage the risks associated with wildlife strikes. I am happy to answer any questions.

Mr. COSTELLO. The Chair thanks you for your testimony, and now recognizes Mr. Ostrom.

Mr. OSTROM. Chairman Costello, Ranking Member Petri, and Members of the House Transportation and Infrastructure Subcommittee on Aviation, thank you for inviting me to participate in this hearing. My name is John Ostrom, and I am the Manager of Airside Operations for the Minneapolis-St. Paul International Airport. I am also proud to serve as the Chairman of Bird Strike Committee-USA, and I am testifying on behalf of this organization.

Bird Strike Committee-USA was established in 1991 as an independent, nonprofit organization dedicated to providing leadership to the aviation wildlife hazard management community. Our focus is on the exchange of information, training and education, and the promotion of research and development to reduce the threat of wildlife hazards to aircraft operations.

Bird Strike Committee-USA is directed by a steering committee comprised of representatives from the Department of Defense, the Federal Aviation Administration, the United States Department of Agriculture's Wildlife Services, the aviation industry, and U.S. airports.

From the dawn of aviation to the present day, wildlife has posed a significant threat to aircraft and to the passengers they carry. However, the threat has significantly increased in recent years as a result of highly successful environmental programs during the past 40 years that have resulted in dramatic increases in populations of many bird species in North America that are hazardous to aircraft. For example, 24 of the 36 largest bird species in North America have shown significant population increases in the past 30 years, and only three species have shown declines. The nonmigratory population of Canada geese has quadrupled from 1 million to 3.9 million birds in the USA from 1990 to 2008.

Over the past 18 years, our organization and its members have worked diligently to bring awareness of this increasing problem to the forefront of the aviation industry. We have made significant progress, but have much still to do to realize our vision fully.

On August 22, 2007, then Chairman of Bird Strike Committee-USA, Dr. Richard Dolbeer, sent a letter to Vice Chairman Robert Sumwalt of the National Transportation Safety Board. In it, Dr. Dolbeer expressed grave concerns regarding continuing hazards to aviation from conflicts with wildlife, especially birds. We asked for

a further review of National Transportation Safety Recommendations A-99-86 through -94 that were issued on November 19, 1999. In the letter we identified five significant strike events that occurred between September 2005 and June 2007 that were at least as serious as those encounters which triggered the board's recommendation in 1999.

We also acknowledge the work done by the Federal Aviation Administration to improve wildlife control at airports by the then-recent update of Title 14 Code of Federal Regulations Part 139, which included increased guidance on how airport operators must mitigate wildlife hazards.

Some of our specific concerns then and now are that there has never been a joint industry-government body established to address or even define the issue. There is no recognized metric or standard to judge whether conditions are improving or worsening, and there is no comprehensive industry-government plan to address the hazard to aircraft and human life.

In 2008, Bird Strike Committee-USA reorganized to better address the changing needs of the aviation safety and wildlife management industries. As part of that effort, we identified seven goals. For the sake of brevity, I would like to focus on three of those goals, specifically 2, 6, and 7: No. 2, serve as the liaison to national and international bird strike committees and to other professional aviation and wildlife organizations; 6, promote the collection and analysis of accurate wildlife strike data for military and civil aviation in the USA as a foundation for, A, understanding the nature of strike hazards, B, developing effective and appropriate management programs, and C, evaluating the efficacy of management programs; goal 7, anticipate future wildlife challenges to aviation and provide leadership in promoting education, research and development of effective methods for reducing wildlife hazards to aviation.

In conclusion, significantly reducing the aircraft wildlife strike will require a collaborative effort by all aviation stakeholders, with a major investment in education and research and development.

Chairman Costello, Ranking Member Petri, and Members of the House Transportation and Infrastructure Subcommittee on Aviation, I would like to thank you again for allowing me the opportunity to testify about the work being done by the volunteers of Bird Strike Committee-USA to reduce the hazards to aviation posed by wildlife. We welcome the opportunity to continue working with you to ensure that our skies remain safe. Thank you.

Mr. COSTELLO. Thank you, Mr. Ostrom, for your testimony.

Mr. Sumwalt, you indicated in your testimony that the engines on Flight 1549 on the aircraft exceed today's standards, but they still failed; and that is of great interest to the NTSB.

I wonder if you might elaborate on that.

Mr. SUMWALT. Well, thank you, Mr. Chairman.

The certification standards are extremely complex and, as I mentioned in the testimony, we will have a public hearing regarding this accident. And certification standards will be something that we will look at to try and get our hands a little bit better around.

Mr. COSTELLO. And the reporting requirements, the FAA did not think that they should be mandatory, the NTSB does. Is that still the NTSB's position?

Mr. SUMWALT. Let me take a look at that recommendation. Mr. Haueter has it right here.

Mr. HAUETER. That recommendation is ″closed—unacceptable response,″ and so we are still looking at that issue. Obviously, from this accident, we will revisit it again.

Mr. COSTELLO. Very good.

Ms. Kolander, you said—you touched on the training, what some airlines are doing, other airlines are cutting back.

I wonder if you might elaborate and tell us just how much training should flight attendants and flight crews receive and how often should they receive in-service training?

Ms. KOLANDER. I think right now the regulations, we do have to attend training every 12 months, which we are in agreement with. The difference now is flight attendants are not required under the regulation to have hands-on emergency training every 12 months; and that is basically that they would use the emergency equipment.

Currently, they are allowed every 24 months to do hands-on emergency equipment; and our concern is that the reality is, our environment is this emergency equipment. This is the most important tool that we have besides the training in the cabin. So we would like to see that addressed further.

I can't necessarily say how many hours. The regulations currently stipulate hours, but what happens is, the regulations also allow the carrier to reduce those hours, using computer-based training or distance education. While there are some merits to distance education or computer-based training, the reality is, those types of training are relevant only to facts. They are not a training that would teach psychomotor skills or performances; and those are things that are very important in the flight attendant world—real-life scenario training, not just taking a piece of equipment out and knowing the location, operation, and function, which is required in the regulation.

Mr. COSTELLO. Thank you.

Captain Prater, you indicate in your testimony that you are unaware of any airline that provides wildlife avoidance training. Is that correct?

Mr. PRATER. No. In fact, there is not extensive—basically, it is limited to keep your landing lights on below 10,000 feet. It used to be, keep your radar on, under the assumption that maybe a beam of radar might send a signal. And then the last one is probably climb, because the birds will hopefully dive.

Mr. COSTELLO. In your opinion, what would your recommendation be to airlines as far as wildlife avoidance training? Should they in fact provide that type of training to pilots?

Mr. PRATER. I am not sure there is that much that can be done to train. It is like anything else, it is—if it hits a propeller, if it hits a windshield and breaks a windshield you are going to deal with the situation that is caused.

I believe that the wildlife mitigation will help quite a bit. I think we need to concentrate our efforts on that, as well as the things

we discussed several weeks ago. Even the introduction of NextGen that can keep airplanes out of those low altitude environments for long periods of time would certainly reduce the risk.

Mr. COSTELLO. Thank you.

Last question: Mr. Reis, we talked about in my opening statement, and of course you touched on what you are doing at the Seattle-Tacoma International Airport in conjunction and cooperation with researchers at the University of Illinois as far as developing enhanced monitoring through the use of an avian radar system.

One, at this stage, exactly where are we with the research, and is it working, and what is the cost of the equipment at this point?

Mr. REIS. Well, it is working to the degree or if you measure working by, are we able to accurately track the birds? Absolutely.

As one of the slides indicated, the slide was almost completely red over a 72-hour period, indicating the ability to track the fowl. We will be getting the first three reports from the researchers this June. They will be preliminary in nature and address the nature of the equipment, its effectiveness in mapping birds, how we can enhance bird detection, and analysis of the impacts of the storm water ponds around the airport in attracting birds.

So I think we are in early stages of the research and would imagine it would be some years before we and the FAA and other airports would be ready to recommend any specific long-term use of it.

Mr. COSTELLO. Do you know the approximate cost of the equipment?

Mr. REIS. We contributed $70,000 to the equipment. I believe, all told, it was about $2- or $300,000 to bring the equipment in and install it.

Mr. COSTELLO. Very good. Thank you.

The Chair now recognizes the Ranking Member, Mr. Petri.

Mr. PETRI. Thank you, Mr. Chairman.

Thank you all for your testimony. And I particularly want to thank Mr. Ostrom and your organization for your persistence and the important job of drawing people's attention to this growing threat.

We came very close to losing 150 lives; and it ought to be a warning, because it won't be the last time this happens, and it is a growing threat. And we talk about all kinds of safety procedures on planes—and guides and so on and so forth—but if we are putting 24-pound balls of bone and flesh into engines, there is nothing that is going to save someone along the way from a serious fatal accident.

So this should be greater priority to get these—these things are supposed to be migrating along about Thanksgiving or a little later, but unfortunately because people feed them, because birds have been injected into the flock that have been nested by human beings and never knew how to migrate, they are staying year 'round around airports and so on.

I have a question really. I wonder if—especially if the people who are knowledgeable, especially knowledgeable about piloting, could comment on this.

It is my impression that this is almost a miracle and that Captain Sullenberger, particularly—and everyone, of course, deserves

plaudits. But talking about ditching an airplane—I mean, with some power, with some altitude, yes. But at 3,000 feet with no power?

And I have seen pictures of water landings. You say, Oh, well, that is great. If you catch a wing, it flips. And in this cold weather, everyone would have perished in all likelihood; even in regular weather, people probably would have perished.

I wonder if you could just comment on the odds of this sort of thing and what was involved to pull this off successfully. He made it look almost easy, and quietly and coolly walked down the aisle twice to check, like the captain of a sinking ship. We forget they sometimes have hours; here is a matter of 2 minutes.

And maybe, Mr. Sumwalt, you would like to start. And I know Captain Carey and Captain Prater may have a comment as well.

Mr. SUMWALT. Well, thank you.

I certainly don't want to take anything away from the notion of a miracle, because it really is quite amazing that the outcome was as positive as it was. So there is a lot of that involved in this.

I also do want to point out what appears to be the exceptional flying skills of the crew, as we heard from the first panel, in addition to scientific reasons, such as the greater crash survivability of the aircraft and the training that crews undergo. I think that the Board will find—as part of its investigation—that there were a number of factors that caused this accident to have a positive outcome.

We at the Safety Board look forward to exploring those issues and producing a comprehensive product so that we can learn as much about what went right in this case as, oftentimes, what went wrong. Thank you.

Mr. CAREY. Thank you, Mr. Petri.

I will tell you one other kudo for Captain Sullenberger. Not only did he make those last two swipes checking for any survivors or making sure he had his work complete, he went back into the cockpit as the airplane was sinking and took the logbook out, and—I mean, that is unheralded. As a matter of fact, when we saw him at the hospital and then back at the hotel, he handed it to me. It was dry as a bone.

So this man's job never stopped. And I think that is just part of his experience, as I think the miracle equals the experience, because I think what he did was remarkable.

And you know, when he talked about—he made a very candid comment prior, in other venues. And he said that he had been making deposits his entire career, that maybe 1 day he would have to make a withdrawal.

And one time when we were talking to him during the investigation he made a comment that he had seen—when Mr. Costello was bringing up previous experiences, he had seen the cartwheeling of that 767 in the Philippines. And he was making mention that all he concentrated on is keeping those wings level.

So not only did he go back in the cockpit and go get the logbook for us, which is remarkable, he had visions from his experience and vast things that he has become acquainted with in aviation and remembered the cartwheeling of that 767. All that came together and created the miracle.

Thank you.

Mr. PRATER. Congressman, I would like to add a few words to that.

I think all the words will never adequately give Captain Sullenberger and his crew the credit that they deserve. But each one of our passengers, just like each Congressman, Congresswoman that gets on the back of any one of our airplanes would expect their crew to do the same thing if it happened. Our professionalism is based upon sharing, openly sharing with other pilots, other unions; all of our administrators and our regulators share everything. The more we do that, the safer we make this industry. It is the foundation of our seniority systems that we use.

When I was a young pilot 35 years ago and I would fly with a captain, he wasn't worried about me taking his job because he taught me too much. He shared everything that he could. In fact, the words that I remember the most are, You will fly with a lot of captains, son, before you get your own command; take the best of every one you fly with, throw the worst out, and become your own commander. Because of our systems—that we trust our first officers, they are not trying to take our job, they are not trying to steal our job, they are in a seniority system. So we share everything.

The system that we talked about earlier and the concern that we have with the experience of many of the new pilots coming into the system and whether we can retain the old, experienced ones is based upon the fact that now US Airways, Continental Airlines, United Airlines have laid off many of their pilots. Our industry is losing those pilots. Many of those pilots have 10, 12, 15 years' experience, yet many of our other airlines, called our regional carriers, they can't afford to go to work there, quite simply. You can't go to work when you are 30, 40 years old for $18,000 a year. We lose that experience.

Those are some of the things that we have to address and we need to address in the near future.

Mr. COSTELLO. The Chair thanks you and now recognizes the gentleman from Ohio, Mr. Boccieri.

Mr. BOCCIERI. Thank you, Mr. Chairman. And I appreciate you again for assembling this panel.

And Captain Prater, I couldn't agree with you more. I see some of the buddies I fly with out of my Air Force Reserve unit who go and fly and are making 12 to 15,000 bucks a year; and if they didn't have that second income of being a Reserve pilot, they would never be able to maintain their duties as a first officer on some of these regional jets.

And I guess I want to hear from Ms. Gilligan, do you concur with the testimony that we have heard today from these very experienced and well-trained individuals that we are approaching a crisis in our aviation industry?

Ms. GILLIGAN. We certainly share the concern about where the professionals for the next generation are going to come from, not just in the piloting ranks, but in the mechanics ranks, in the engineering ranks.

Unfortunately, the reality of the United States is that we are not attracting people to those kinds of technical areas. We need to

work as a community. And we certainly have had our conversations and our forum sessions, but no one has really come up with the sort of fundamental solution that will attract young people into these particular areas. Having said that, we need to continue to focus on it.

But I do want to comment that, you know, we can't replace experience, and you can only gain experience with time. But we can make sure that anyone who enters the flight deck is trained and competent to perform those functions. And I think what you are hearing here is that even for those entry-level pilots, they are coming in with that kind of training.

We have a proposal out now actually to strengthen our training requirements as well. That final rule will help us continue to move forward, trying to supplement experience with sufficient training.

Mr. BOCCIERI. Can I add, too, that, you know, the military is putting stop-loss on critically manned fields so there is not an overflow of military pilots into the field. And when it costs maybe $5- to $15,000 just to obtain a private pilot's license to get an entry level job with, you know, 100, 200, 300 hours into these, is it just a matter of money? Is it a matter of money in terms of where the FAA is going to make their assessment?

Ms. GILLIGAN. Well, again I think it is also attracting skilled and interested young people. We have got to get the pool. We have to build the pool larger so that we have the skills to draw from.

The economics of both the industry and generally will certainly play a role in where young people choose to go to make their careers. I think we at FAA agree that this is an exciting industry to be a part of. It has a lot that should attract young people into it, and we need to be able to take advantage of that.

Mr. BOCCIERI. Captain Prater, did you want to comment?

Mr. PRATER. Just a quick comment. Last year I spent 5 days with General Renuart doing a six-base tour, and at every air base was met by pilots flying F-15s,-16s,-18s,-22s, C-17s. Asked every one of them when you complete your duty are you considering the airlines? Very, very few said—″I can't afford it. I will be 32 when I fill my commitment. I may put in my 20, but I am not going to go work for those wages. I will use my education and training to take care of my family, as much as I love flying.″

Mr. BOCCIERI. There is no question that they are making those kinds of decisions. And the high-skilled training that we received in the Air Force is, in my opinion, unmatched. We have folks from other countries that come and train with the United States Air Force.

But I guess I am very concerned about this because I hear from air traffic controllers that they have equipment that is outdated and that they have equipment that could be a real jeopardy in terms of making sure that we have a success story like we have and we are hearing today.

And we have got to—and this panel, this Committee, will be charged with the responsibility of making sure we have a 21st century aviation industry not only from the highly skilled and highly trained, but also that we have the right equipment. And I guess I want to just hear publicly that we are at this crisis mode and that the time to act is now.

Do you have a comment?

Ms. GILLIGAN. Well, again, I think we agree that we need to be upgrading the air traffic system. This Committee will have a hearing on the Next Generation Air Transportation System shortly. You have had other hearings in the past.

And again, as an industry I think you are seeing that we are coming together and we are dedicated to making those kinds of improvements. I think the system that we have in place now will hold us in good stead while we move toward that modernization. But we need to move in that direction.

Mr. BOCCIERI. Thank you, Mr. Chairman.

Mr. COSTELLO. The Chair thanks the gentleman from Ohio and now recognizes the gentleman from Illinois, Mr. Lipinski.

Mr. LIPINSKI. Thank you, Mr. Chairman. I wanted to focus in on the bird radar. It is very interesting.

As an engineer, I know it is not an easy thing to detect birds. So it is interesting to me, Mr. Reis, your testimony on this. I am just wondering how close are we, or are there things that still need to be worked out with the bird radar to make it effective? I know there are issues beyond detecting them. It is what you do once you detect them.

But how close are we to saying we do have this system, radar system, that we need?

Mr. REIS. Well, I think from the perspective of, is the system working to detect birds, the simple answer is, yes, that system does exist. It is working every day at Sea-Tac. The question is, what can you do with that data?

I mean, at this point, we probably have too much data. The key thing for operations is, how do you filter that data down to the critical data that would be important to air traffic controllers and to pilots or, frankly, long term for airports to better understand the dynamics of the bird populations around the airport and what we can do about them.

I think we are closer to the second set of challenges than we are the first. We are learning about bird population habits beyond what we already knew. We are learning with greater accuracy. We can track movements 24 hours a day, 365 days a year, as opposed to when people are available to observe it manually. So in that way we are going to be better able to design our wildlife management plans, our wildlife mitigation programs, et cetera. And the bird radar will help us do that in the short term.

I think it would really be more for airline and FAA flight experts to offer an observation once we provide them more data about the radar as to how readily we would be able to use that data in real time to assist air traffic control and/or pilots.

I would imagine trying to avoid a flock of birds with an aircraft is not an easy thing to do. And so I think it is—I would want to lower expectations that somehow or another this data will be available anytime soon in real time to advise a pilot what to do on approach.

Mr. LIPINSKI. Thank you. I want to ask Ms. Gilligan, I know that O'Hare Airport in Chicago has been slated for—information I have that came out in the middle of January—one or two radar systems are slated for deployment at O'Hare. Where is that right now?

Ms. GILLIGAN. Mr. Lipinski, I believe that deployment is due within the next couple of months, but I will confirm that back to you.

Mr. LIPINSKI. Has there been an issue with that? Because I think January 16th I have a fact sheet that said it would be 6 weeks from then. I was just wondering, have there been problems with the deployment?

Ms. GILLIGAN. No, sir. Not that I am aware. Let me make sure that I can confirm to what exactly what the scheduled plan is.

Mr. LIPINSKI. Thank you. Thank you, Mr. Chairman.

Mr. COSTELLO. The Chair thanks you and thanks our witnesses for appearing here today and offering their very thoughtful testimony. We appreciate your testimony and look forward to continuing to monitor as the investigation moves forward with the NTSB, not only on Flight 1549, but also on the avian issue that we are dealing with here, and no doubt will be dealing with in the future. So we thank you for your testimony.

That concludes the hearing. The Subcommittee stands adjourned.

[Whereupon, at 1:01 p.m., the Subcommittee was adjourned.]

OPENING STATEMENT OF
THE HONORABLE RUSS CARNAHAN (MO-03)
HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMIITEE
AVIATION SUBCOMMITTEE

Hearing on
US Airways Flight 1549 Crash

Tuesday, February 24, 2009
2167 Rayburn House Office Building

Chairman Costello and Ranking Member Petri, thank you for holding this hearing on the U.S. Airways Flight 1549 accident.

First I would like to commend the crew of U.S. Airways flight 1549 for their quick response on board that averted a major catastrophe and all passengers on board the flight for their courage.

Although, multiple bird strikes, as occurred to flight 1549, is an extremely rare occurrence it does make clear the need to ensure flight crew can quickly respond to any type of emergency in a coordinated manner. The crash of flight 1549 gives us the opportunity to look at all aspects of both the crew and controller's response to teach others how to respond in an emergency and any improvements can be made to the current emergency communications aboard a plane. Currently, the Federal Aviation Administration requires pilots and flight attendants to undergo Crew Resource Management training to improve communications between pilots and crew during an emergency. I am interested in hearing from our witnesses if there are any improvements that can be made to this training to better prepare for emergencies.

According to the U.S. Department of Agriculture's Wildlife Services bird strikes in the United States cause an estimated 550,000 hours of aircraft downtime and cost U.S. civil aviation more that $500 million annually. Additionally, I understand there is research being done on bird radar detection systems to scan runway and above ground level to detect birds, sends this information to air traffic control, which provides automated monitoring and altering to the controller. The Federal Aviation Administration has said that more testing is required before widespread implementation to ensure that that radar is operationally effective. I also have some concern about the about the cost to benefit ratio of widespread use of such technologies.

In closing, I want to thank our witnesses for joining us today, especially the crew of U.S. Airways Flight 1549, and I look forward to hearing their testimony.

STATEMENT OF
THE HONORABLE JERRY F. COSTELLO
SUBCOMMITTEE ON AVIATION
HEARING ON
US AIRWAYS FLIGHT 1549 ACCIDENT
FEBRUARY 24, 2009

- I welcome everyone to the Aviation Subcommittee hearing on the US Airways Flight 1549 Accident.

- I want to thank our witnesses for being here today, especially the flight crew -- the pilots, flight attendants, and air traffic control specialist -- that brought US Airways Flight 1549 down safely on the Hudson River. I know my colleagues will join me in giving them a round of applause for doing an outstanding job in saving the lives of so many people.

- As everyone knows by now, on January 15, 2009, US Airways Flight 1549 was departing LaGuardia Airport for Charlotte, North Carolina and within minutes lost engine power.

- Captain Chesley Sullenberger III and First Officer Jeffrey Skiles realized the seriousness of the situation and immediately sought a safe place to land. The Hudson River was their only option and these two pilots, as well as flight attendants Sheila Dail, Doreen Welsh, and Donna Dent worked together to prepare the 150 passengers for the emergency landing.

- The crew did an excellent job on the controlled landing in the Hudson River. This incident demonstrates the importance of training and preparation, showcases the skill of aviation workforce, and reinforces the importance of consistent vigilance and oversight of aviation safety.

- I would be remiss if I did not mention that just a few short weeks after this incident, the entire nation mourns the loss of Colgan Air Flight 3407 crew and passengers. Fifty people died as a result of that crash, and information is still being gathered and an investigation underway to determine the cause of that crash.

- The United States has the safest air transportation system in the world – in 2007, there was only 1 fatal accident in 10.9 million U.S. airline departures. However, we must not become complacent about our past success.

- These recent accidents once again place aviation safety in the spotlight. It is the responsibility of this Subcommittee to ensure that the Federal Aviation Administration (FAA) is fulfilling its duties to provide effective oversight of every

aspect of the aviation system, and I am interested in hearing from the FAA and the National Transportation Safety Board on these issues.

- This situation also highlights the association between training, workforce development and aviation safety. The current economy has the entire workforce being asked to do more with less, including work longer hours. To that point, we must make certain that fatigue does not become an issue, as it creates risks to the safety of the air traffic system.

- Finally, even though the bird strikes that caused US Airways Flight 1549 to lose both engines and land in the Hudson River has brought greater attention to the issue, the danger presented by avian life is nothing new. The Seattle-Tacoma International Airport, in conjunction with the University of

Illinois in my home state, is using an enhanced radar system to better deal with bird detection. O'Hare, John F. Kennedy and Dallas Fort-Worth International Airports are all slated to receive similar radar systems this year. I am interested in hearing more about this technology from Mr. Mark Reis.

- Again, I want to thank the flight crew and air traffic control specialist for being with us today, I commend you on a job well done and look forward to your firsthand account of the January 15, 2009 accident – and what we can learn from the incident for the future.

- Before I recognize Mr. Petri for his opening statement, I ask unanimous consent to allow 2 weeks for all Members to revise and extend their remarks and to permit the submission of additional statements and materials by Members and witnesses. Without objection, so ordered.

Opening Statement of the Honorable Eddie Bernice Johnson
Transportation & Infrastructure Committee
Subcommittee on Aviation
Tuesday, February 24, 2009 – 2167 RHOB @ 10:00am

Thank you Mr. Chairman.

I want to thank you and Ranking Member Petri for holding today's hearing. I would also like to associate myself with the laudatory remarks offered by my colleagues.

Without question, the heroic actions of—not only crew members but— all persons involved in the events surrounding Flight 1549 on January 15th are nothing short of remarkable.

Mr. Chairman I think it goes without saying that the mere fact that all 155 lives aboard Flight 1549 survived is a resounding testament to sound training and skill on behalf of the flight

crew, air traffic controllers, and first-responders.

All too often, we as commercial passengers take for granted the numerous safety practices and redundancies exercised by our nation's aviation professionals. However, as evidenced by the skillful and rapid response events surrounding the emergency landing of Flight 1549 into the Hudson River, it is this type of adherence to safety that, quite frankly, continues to contribute to the U.S. Commercial Aviation System as being one of the safest in the world.

As I close I want to thank our distinguished panel this morning, and commend each of them for their respective and collective efforts in ensuring that each and every passenger aboard Flight 1549 was afforded a second chance to return home to the people that love and care for them.

Thank you Mr. Chairman. Again, I welcome our distinguished group of witnesses this morning. I look forward to hearing and learning from you and yield back the balance of my time.

Michael E. McMahon

The Honorable Michael E. McMahon
Statement and Questions
Aviation Subcommittee
Committee on Transportation and Infrastructure
US Airways Flight 1549 Accident
February 24, 2009

Thank you Chairman Costello and Ranking Member Petri. I would also like to extend a warm welcome to all of our witnesses today, but I offer a special thank you and welcome to Captain Sullenberger, First Officer Skiles, Flight Attendants Dail, Dent and Welsh and Air Traffic Control Specialist Harten.

All of us – particularly those from New York and New Jersey -- owe you a great debt of gratitude. Your quick decision-making and experienced judgment saved the lives of everyone aboard US Airways Flight 1549 as well as the lives of countless people on the ground. Your actions have reinforced for us the importance of investing in our air professionals and rewarding experienced and dedicated service.

You may know that on January 26, 2009 the House approved House Resolution 84 honoring your heroic actions – a resolution that I proudly cosponsored and that passed with a unanimous vote of 402 to 0.

I would ask unanimous consent that the text of that resolution be placed into the record and that an official print of the resolution be provided to our guests at some point after this hearing.

When Flight 1549 landed in the cold, icy waters of the Hudson River on the afternoon of Thursday, January 15th, 2009, many of us feared the worst.

When both engines failed, Captain Sullenberger made a critical decision to land in the river and avoid densely populated areas.

In addition, the crew of Flight 1549 showed the utmost of professionalism and training by quickly getting the passengers off the plane and into waiting rescue watercraft.

It is nothing short of a miracle that everyone on US Airways flight 1549 survived.

From the skill of the flight crew and air traffic controllers who helped guide the plane to a near perfect water landing;

To the great flight attendants, who evacuated the cabin and cared for the passengers –even giving your own clothes off your backs to keep passengers from developing hypothermia,

To the first responders and good samaritans on the commuter ferries who helped bring people to safety.

And to Captain Sullenberger, who did not even leave the plane until walking the aisles of the cabin twice to be sure everyone had been evacuated.

I offer you my personal thanks for your hard work, courage under fire, quick action and kindness that saved so many lives and brought a happy ending to a story that could have turned out much differently.

Thank you.

Statement of the Honorable John L. Mica

Ranking Republican Member

Committee on Transportation and Infrastructure

Subcommittee on Aviation Hearing On:

US Airways Flight 1549 Accident

February 24, 2009, 10 a.m.

I thank the witnesses for joining us for today's hearing on US Airways Flight 1549.

Every now and again, we are reminded of the risks associated with flying. Flight 1549's safe, albeit unusual, landing on January 15, 2009 is certainly a stark reminder.

Ingrained in my mind are the stunning pictures of the crew and passengers in life rafts and perched atop the wings of the airplane floating in the icy waters of the Hudson River.

Without a doubt, the professionalism and skill of the crew, air traffic controllers, and rescue personnel saved the lives of all aboard Flight 1549. When confronted with a deadly hazard and double engine failure, this crew performed magnificently and they deserve the highest accolades of this Committee.

The passengers also deserve credit for remaining calm, following directions, and helping each other under very stressful conditions.

We also must not forget the unsung heroes of Flight 1549, the aircraft design engineers and FAA regulators who are responsible for ensuring the aircraft's survival in the event of such an emergency situation.

While it is a blessing that all 155 people aboard Flight 1549 escaped unharmed, we must remember that the outcome could have been very different. Just a few degrees of wing dip could have resulted in catastrophe.

While disaster was thankfully averted, this accident reminds us of a known and persistent hazard to aviation--birds.

Last August I, along with Orlando Sanford Airport, assisted in hosting Bird Strike Committee USA at its annual conference in my Florida District. The meeting allowed the exchange of information on the risk birds pose to both civil and military aviation. I was pleased be a part of and address a group that included representatives from the USDA, NASA, DoD and airports. Participants from twenty-two nations joined in seeking solutions and new approaches to the avian hazard problem facing aviation.

Through events like the Bird Strike Committee Meeting, we can seek ways to improve our efforts to reduce the hazard birds pose to aviation safety.

Bird strikes generally do not get a whole lot of attention because rigorous certification standards enforced

by the FAA ensure that most incidents end with relatively safe outcomes.

However each year, there are roughly 7,000 bird strikes in the United States costing the civil aviation industry an estimated $620 million dollars.

According to industry experts, only 20 percent of bird strikes are actually reported and entered into the FAA's bird strike database. This means that scientists and policy makers do not have a full understanding of the problem.

Roughly 90 percent of all reported bird strikes occur below 2,000 feet near airfields. This is not entirely surprising given that many airports are constructed in ideal bird habitats close to water. Due to the increased threat, airports have been required to identify potential wildlife hazards and develop wildlife mitigation strategies.

Airports use a variety of strategies to ward off avian

hazards. However, these efforts are complicated by a myriad of state and federal species protection laws. These laws often tie airport operator's hands.

I believe that a thoughtful conversation about how to best resolve the apparent conflict between environmental protection laws and airfield safety is critical to properly mitigate the bird strike hazard.

As was the case with Flight 1549, potentially deadly bird strike incidents can occur thousands of feet in the air and miles away from an airport. Therefore, ground-based and on-board bird hazard mitigation technologies should also be considered. Unfortunately, these technologies have been slow to be developed and presented to FAA for certification.

At the same time, aircraft engine standards have also been slow in development. On the positive side, recently the FAA issued updated engine standards that have

enabled aircraft engines to be more robust in cases of bird strikes.

However, after years of research, it is unclear which bird detection or dispersion technologies are effective and should therefore be considered for FAA certification and eligibility for AIP airfield safety funding.

It is quite clear that we need an integrated, balanced approach to address bird strike hazards. Currently, mitigation efforts and oversight are "stove-piped." Airports deal only with wildlife mitigation issues, engine certification inspectors and manufacturers address only engine issues and wildlife specialists study only bird behavior.

What is lacking is a comprehensive clearinghouse for avian research, technology development, and best practices in order to reduce the bird strike hazard in a coordinated way. I look forward to hearing the witnesses' ideas on how to improve the current situation.

US Airways Flight 1549 is an unlikely success story. Those involved played a significant role in the survival of all aboard the aircraft.

However, in keeping with this Subcommittee's charge of ever improving aviation safety, it is important that we also discuss how to improve upon efforts to mitigate one of the oldest hazards to manned flight----- birds.

I thank all of our witnesses for participating in today's important hearing, and look forward to your testimony.

Statement of Rep. Harry Mitchell
House Transportation and Infrastructure Committee
Subcommittee on Aviation
2/23/09

--Thank you, Mr. Chairman.

--I wanted to take this opportunity to commend the unparalleled bravery exhibited by Captain Chesley B. "Sully" Sullenberger III and his crew on U.S. Airways Flight 1549 on January 15, 2009.

--The cool heads, sound judgment and well practiced safety procedures saved not only 155 lives on board, but countless more that could have been injured or killed on the ground.

--I am so proud the US Airways calls Tempe, AZ home, and I'm especially proud of the heroic crew of Flight 1549.

--I look forward to hearing more from our witnesses on what happened on this fateful day and what we can do to prevent further incidents.

--I yield back.

OPENING STATEMENT OF
THE HONORABLE JAMES L. OBERSTAR
SUBCOMMITTEE ON AVIATION
US AIRWAYS FLIGHT 1549 ACCIDENT
FEBRUARY 24, 2009

I want to thank Chairman Costello for calling today's hearing on the US Airways Flight 1549 Accident. We are honored to have the pilots and crew here to tell us their stories first-hand. They handled this situation with incredible skill, precision, and the utmost professionalism. Captain Sullenberger and First Officer Skiles expertly ditched the aircraft in the Hudson River; and flight attendants Welsh, Dail, and Dent braced passengers for impact and quickly assisted them out of the aircraft. Thank you all for being here today. We are also honored to have the air traffic controller, Patrick Harten, with us to explain how he assisted Captain Sullenberger in finding a landing location and directing air traffic.

It is especially important for all of you to be here in light of the tragic events of February 12th, when all 50 passengers and crew perished on Colgan Air Flight 3407 near Buffalo. My deepest sympathies are with the families, colleagues, friends, and communities of those affected by this disaster. The NTSB's investigation into that accident may bring about further improvements to aviation safety.

Member Robert Sumwalt of the National Transportation Safety Board is here to share what the Safety Board has uncovered thus far in its investigation of Flight 1549. I am pleased to learn that the Safety Board will hold a public hearing to explore many important issues that have arisen out of this accident.

The FAA's new Associate Administrator of Aviation Safety, Peggy Gilligan, is here to share FAA's important work on improving aviation safety. I am particularly interested to learn about FAA's regulations pertaining to training and education for pilots and flight attendants, testing standards for aircraft engine bird ingestion, optimum aircraft design standards to increase crash survivability, and wildlife mitigation programs at airports. The Agency's vigilance pertaining to safety issues will continue to be closely monitored by this Committee.

These recent accidents raise important questions about crew training. I am particularly concerned that due to economic concerns, carriers may be cutting back their training programs to the minimum-required levels. The combined experience levels of the crew of Flight 1549 – over 140 years total; and almost 40,000 flight hours for the pilots – is quite remarkable. As the industry's financial condition improves and it begins to hire new pilots and flight attendants, we must ensure that they are fully trained to handle emergency situations. The industry also needs to attract the

best people to these jobs by offering good salaries and benefits, just as they used to. I thank the pilot and flight attendant unions for being here to testify on these subjects.

I also thank our other witnesses for being here to share their expertise in bird hazard mitigation—Mr. Reis, with the Seattle-Tacoma Airport and Mr. Ostrom, with the Bird Strike Committee-USA. The more information on birds and wildlife that is collected, the better-equipped we will be to mitigate risk and prevent disasters. In 2007, there were almost 7,500 reported bird strikes. However, it is estimated that only about 20 percent of strikes are reported to the FAA. I am particularly interested to learn about new avian radar detection technologies that are utilized in some airports, and those that are still in development. I appreciate that navigating the complexities of federal, state, and local laws governing the various issues relating to birds and wildlife is no easy task for an airport. I hope to learn more about what airports are doing to reduce wildlife strikes.

Thank you again, Mr. Chairman, for holding this hearing. I look forward to hearing from our witnesses.

Statement of the Honorable Thomas E. Petri

Ranking Republican Member

Subcommittee on Aviation Hearing On:

US Airways Flight 1549 Accident

February 24, 2009, 10 a.m.

Good morning. It seems that Congress routinely, or at least fairly regularly, calls up federal officials, industry representatives and others in order to lambaste and criticize them for some deficiency or another. After all, that is at least part of our job in providing oversight. But I think it is also important that we stop and take a moment to recognize when things actually go right. On January 15, a lot went right in the middle of a horrifying situation. I think we owe it to those involved to say "Job well done."

At the same time, as we hear their experiences, we can learn important lessons for the future.

As Captain Sullenberger has repeatedly pointed out, the positive outcome of Flight 1549 was a team effort, from those in the air, on the ground and on the water. I would be remiss if I did not acknowledge the courageous actions of the flight crew, air traffic controllers, rescue teams and the passengers themselves. Their professionalism, bravery and calm under pressure prevented a catastrophe. For that, we thank them.

So, what have we learned so far from the events of January 15?

Clearly, training played a central role. Without proper training, even the most advanced avionic equipment is of no value. The fact that Flight 1549 was able to make an emergency landing and quickly evacuate, in a river no less, without any serious injury proves the effectiveness of pilot and crew training programs. The assistance provided by air traffic controllers and quick response by rescue teams are also indicative of the importance of quality training. So many of them have said that when confronted with the situation, their training simply "kicked in" and they knew exactly what to do.

We must not forget other factors that contributed to this positive outcome.

High certification standards ensured the plane's survivability after the bird strike, double engine failure and controlled ditching into the Hudson River.

Even more, they allowed the plane to stay afloat as passengers and crew were evacuated and rescued. These standards are established to improve safety and enhance aircraft survivability. In this case, they saved lives. Procedures were followed, standards were met, training was applied and rescue was immediate. It was-all things considered- a good day for those aboard Flight 1549 and, thankfully, a learning experience for the aviation community.

Despite the success, we must continue to promote the best possible training and the highest equipment standards.

We must also thoroughly analyze the cause of the accident, which appears to be bird strikes and seek ways to mitigate them in the future. Dedication to safety has made our aviation system the safest in the world and we must continue our work to keep it that way.

Again I'd like to thank the Chairman for calling this hearing and our witnesses for taking the time to join us today.

With that, I yield back the balance of my time.

JOHN B. CAREY

US AIRLINE PILOTS ASSOCIATION

BEFORE THE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATION AND

INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

USAIRWAYS FLIGHT 1549 ACCIDENT

US AIRLINE PILOTS ASSOCIATION
5821 Fairview Rd.
Suite 400
CHARLOTTE, N.C. 28209
704 936 4500

Chairman Costello, Chairman Oberstar, ranking Members Mica, Petri and other members of the Committee:

Thank you for the opportunity to provide this submission to the Committee and for allowing me to amplify my previous testimony with respect to the events surrounding US Airways flight 1549. I would like to address six areas of concern that merit the Committee's attention in today's aviation community. Those areas are:

1. Attracting highly skilled and motivated professional airline pilots.
2. Modernization of the U.S. Air Transportation system.
3. Engine certification standards.
4. Equipping transport category aircraft with suitable emergency equipment.
5. Structural certification standards for transport category aircraft.
6. Wild life hazard mitigation

Most importantly we would like to acknowledge the crew of flight 1549 who's bravery and heroics combined with exceptional airmanship saved their passengers lives. This has given our country a chance to proudly celebrate their bold actions. They have also given us the opportunity to reflect on the state of aviation safety.

Because we are a party to the ongoing NTSB investigation, we will not comment on specific areas that would compromise this investigation. The Safety Board, in our opinion, has put a very appropriate emphasis on this investigation, and we are pleased to be a party and to share our expertise. The reason we are a party and the reason that we are here today is to work toward preventing future accidents and to promote aviation safety. Airline pilots have a long tradition of safety advocacy; Capt. Sullenberger is a prime example. It is one thing to talk about being a safety advocate, but airline pilots "walk the walk." Pilot safety volunteers work tirelessly, while dues paying members reach into their pockets each month to support these on-going safety activities. Even now while working under bankruptcy era contracts, our pilots continue to fund these all important safety projects. Each and every union budget contains significant funding for safety.

Nothing could be more gratifying than to see our colleagues from other flight crew unions joining us in testimony. On the afternoon of Jan. 15 every airline pilot in the world put themselves into the cockpit of flight 1549. By now we, as a collective group, have thought "what if I had been at the controls that day?" We all share these feelings, and in a very real way, Sully and Jeff have united us. Their professionalism in the cockpit, the poise that they have displayed during and after the event and their personal demeanor has been an inspiration to every pilot. In all of the hangar flying that has taken place since this event, nobody has second guessed the actions of this crew. Not many would predict a similar outcome, were they faced with the same dilemma, which is extremely unprecedented. Airline pilots are their own most severe critics, however, this case is one in which there is no training and almost all agree that a successful outcome would at best be a long shot.

There were many aspects to the successful outcome of flight 1549. Clearly, there was vast experience on the flight deck that day. What is also evident is that the individual pilots and flight attendants are among the best and the brightest that our society has to offer. In addition, our industry was built on many core safety principals that continue to serve us well. The Flight Crew of 1549 embraced and successfully demonstrated these principals and the results speak for themselves.

Regarding crew experience, the industry contraction has had an unintended positive effect. In our opinion, First officer Jeff Skiles is a prime example. Having been with the airline in excess of twenty years, and having previously served as a Captain, his presence on the flight deck significantly contributed to the successful outcome of flight 1549. Due to attrition, this will not last. The greatest hope that we have of ensuring this type of talent and experience on the flight deck in the future is to promote and support a fair negotiating process between labor and management. Supporting a timeline for negotiations will in time promote competitive salary and benefits for professional airline pilots which is central to attracting and retaining a qualified pilot workforce. Congress must also step up to ensure that employee pensions are protected thereby insuring that new hire pilots will remain in the cockpits of our airliners and become the Captain Sullenbergers of the future.

When we talk about core safety values, FAA oversight and regulation is critical. Lack of FAA leadership in developing regulatory guidance for the

implementation of "Safety Management Systems" (SMS) has stagnated the advancement of the industry safety agenda. This issue can be addressed by the FAA commissioning an Aviation Rulemaking committee (ARC) to push this agenda forward. Although some in the industry have voluntarily begun SMS programs on their own, the standards are not uniform and the quality can largely be debated. Without a pure SMS standard, such as those developed by ICAO, individual elements such as FOQA, ASAP, AQP and LOSA are administered differently, thus making airline safety irregular at best.

Talking specifically about issues which may be germane to flight 1549, bird mitigation seems to be a very elusive problem, especially the further from the airport and the higher the altitude. Although much has already been done, further funding and study will be necessary to develop additional means for mitigation. FAA review of FAR 139 relating to wild life hazards should be undertaken immediately.

The failure of the engines on flight 1549 should prompt a fresh look at engine design and certification standards. Although the investigation is ongoing, it seems clear from the facts in the public domain, that we have new data in which to look at bird ingestion. FAA leadership is also critical towards this effort.

The evacuation and rescue phase was unprecedented. Although training in ditching is conducted, it has never been tested in this arena. To safely evacuate 155 people, in this environment is a miracle in itself. The fact that this was all done with the rear two exits and corresponding rafts unavailable made success almost an impossibility. One thing is clear, the entire crew performed heroically throughout the entire evacuation and rescue. They are true heroes and should be recognized as such. Additionally, all of those who operated the rescue watercraft and the many others who performed heroically and unselfishly on the river that day should also be recognized.

Open questions remain as to the survivability of the aircraft. Due to the actions and rapid response of all involved, the sustainability of the aircraft did not become a factor. However, the fact that the aircraft sank to the point that the rear exits and rafts were unusable and did not remain afloat very long after the rescue, should be a concern for future accidents. Hopefully the investigation will shed light on this issue as facts are discovered.

As we further analyze this accident we should realize that the brief 5 minute oral testimony which was presented lasted approximately as long as flight 1549. With a normal takeoff and climb we should realize how little time the pilots had to analyze the situation and make a critical decision of where to land, in one of the most heavily populated areas of the world. All this while attempting to restart failed engines, prepare the aircraft for ditching, and communicating with ATC and the flight attendants and passengers in the cabin.

The following will detail the main issues which were identified in our oral testimony and the preceding text.

Attracting and Maintaining Highly Skilled and Motivated Professional Airline Pilots

The economic and resulting personal hardships recently experienced by all Americans have been ravaging the airline piloting profession since 9-11. The result is that we now find ourselves with an aging workforce that has little choice but to ride out what will hopefully not be the swansong of a previously thriving industry. At US Airways alone, when highly experienced furloughed pilots were offered a return to their old jobs, more than 60% refused, as they sought better opportunities outside of the profession. It is imperative that we return the industry to one in which the brightest and most skilled candidates strive to achieve these previously lofty positions. After all, an experienced and well trained pilot is the single most important safety tool on each and every flight.

Esteemed members of the Aviation Subcommittee, we implore you to use your influence to regulate positive change that will return this industry to one that can again draw from the best and the brightest. We are currently living off investments made in years past, and the performance of the US Airways Flight 1549 crew is the perfect example. Including a definitive timeline to the negotiating process would be a first step to regain the delicate balance between labor and management negotiations. Stagnation and control of the negotiating process by one side or the other is not in the traveling public's best interest. If we start now, the veteran pilots throughout the industry will assist in the transition to the next generation of pilots.

Engine Certification Standards

US Airways flight 1549 suffered a dual engine failure at low altitude and relatively low airspeed as a direct result of the ingestion of at least one and probably multiple large birds in each engine. Although the engines presumably complied with current certification standards, both engines simultaneously lost thrust and were unable to be restarted. In a multi-engine transport category aircraft, such a catastrophic failure of one engine would still allow the crew to execute a safe landing using the thrust on the remaining operating engine(s). A nearly simultaneous loss of thrust on both engines, however, creates an entirely different scenario, as was evident in the case of US Airways flight 1549.

While Bird strikes are considered in the FAA certification process of modern-day turbine engines, the standard by which these engines are certified must be the subject of closer scrutiny. These standards contain a very complicated matrix to determine the test conditions required, including the size of birds. Even in the worst case scenario those limits are based on birds of less than 8.03 pounds impacting at a speed of 200 knots. This is no where near the multiple estimated 20 pound birds that flight 1549 encountered. Under this standard, an engine must be capable of safely shutting down without a catastrophic failure that would cause damage to other systems and components of the aircraft, as well as the cabin and its occupants. Only in the case of testing with small and medium sized birds are there requirements for the engines to continue to produce thrust.

In recent years, successful wildlife conservation programs have produced a growing bird population. While the increased numbers of birds pose a greater hazard to aviation, of equal concern is the size of the birds, often up to 20 pounds, as was encountered in the case of US Airways flight 1549. The need to understand bird population in terms of size and numbers of different species is critical in ensuring that aircraft and engine designs account for those events that are becoming more probable.

Therefore, continued avian research is needed to determine today's bird strike risk and improve engine certification standards. We respectfully urge the Committee to pursue these advances in research and engine certification standards with respect to bird ingestion.

Equipping Transport Category Aircraft With Suitable Emergency Equipment.

Passenger life vests and life rafts are required to be carried aboard aircraft operated under FAR part 121 on "extended over water routes." These routes are defined as a flight path beyond 50 miles from shore. Further, it is common for carriers to receive a waiver allowing operations up to 162 miles from shore with life vests but no rafts aboard. At times "over water aircraft" are dispatched on non-overwater routes which gives an unintended benefit to the passengers and crew in the form of water survival equipment located on board. This was the case of the aircraft used on flight 1549.

Conversely, aircraft not designated as overwater aircraft are not required to carry such water survival equipment. It has now been clearly demonstrated, as in the case of US Airways flight 1549, an aircraft dispatched on a non-overwater route could very well face a water landing and need the equipment required on board "overwater aircraft' to save lives after a successful ditching. One of the many favorable factors that occurred with respect to US Airways flight 1549 was the fact that the aircraft happened to be an overwater aircraft. As a result, the passengers had access to life vests and slides/rafts that they may not otherwise have had in a non-overwater aircraft. Even that may not have been enough. The rear doors (aft left and right) of Flight 1549 could not be opened since they were partially under water. Connected to those doors were slides that also function as required passenger life rafts; and in this case the rafts were unusable since the aft doors could not be open. Hence, many passengers were standing on a sinking wing with water temperature of 37 degrees and no additional life rafts. The first responders in the busy Hudson River clearly saved lives. In this era of cost-cutting, some airlines are removing water survival equipment already on aircraft, if that aircraft is utilized on non-overwater routes. This is due to maintenance costs and weight.

Passengers involved in a water landing on one of these aircraft would have no passive survival equipment. Rather, they must cling to the seat cushion as their only means of flotation. Useful consciousness under the conditions encountered by US Airways Flight 1549 would be a matter of minutes, making rescue impossible. It was also fortunate that the crew of Flight 1549 was able to land close to ferry boats enabling an almost immediate rescue

from the calm but frigid waters of the Hudson. If the exact same successful ditching had occurred but a few miles away offshore, in rough seas, it is doubtful that sufficient raft space would be available and the rescue and subsequent outcome would not have been nearly as successful with an almost certain loss of life. We suggest that the FAA undertake rulemaking to mandate that all aircraft be equipped with life vests and life rafts regardless of the routes on which they are flown.

Modernization of the U.S. Air Traffic Control System

As mentioned in testimony by USAPA and other parties, the best assurance of a well trained, experienced workforce in the cockpit and in the air traffic control facilities is a thriving, vibrant airline industry. The industry is presently being bogged down by inefficiencies in the national airspace system. Our nation's air traffic system is operating with antiquated facilities and equipment, as well as an inefficient traffic management system. Our airports remain inadequate in many ways, including a lack of runways for safe and orderly arrivals and departures. Taxiway and ramp space is inadequate to stage aircraft for procedures such as deicing and air traffic sequencing. The air traffic system is plagued with lengthy delays, inconveniencing the traveling public and costing the airline industry billions of dollars annually. Many hub airports routinely experience arrival and departure delays, even when weather is not a factor. What once was an efficient mode of transportation for the business community has evolved into an unreliable, frustrating, and delay-laden experience. There can be no question that this has had a dramatic effect on the national economy. The costs to our economy are even greater when we consider the fuel being wasted, accounting for more reliance on foreign oil. Therefore, air traffic facilities and equipment must be modernized to increase the efficiency of the U.S. air traffic system. Current traffic management policies and procedures must be improved to more effectively utilize the national airspace system and minimize flight delays. A thriving airline industry also necessitates that we provide our air traffic controllers with state-of-the-art computers, equipment and facilities to effectively and efficiently manage our air traffic system. Although "next Gen" will, hopefully, provide relief for the long term, we must not ignore the present. FAA must complete its work on the ASD-X project and upgrade the current facilities and equipment. Like pilots, as experienced air traffic controllers retire, a shortage of well qualified replacements exacerbates the problem. The FAA needs to find solutions to

the many labor issues to maintain the level of experience in our air traffic facilities.

In this time of increased emphasis on infrastructure, we ask Congress to look no further than our aging air traffic system and airports for investment opportunities. There are many "shovel ready" projects which are worthy candidates for federal stimulus money. This in addition to funding from the aviation trust fund, which remains an untapped resource for much needed aid to our air traffic and airport needs.

While there are numerous projects which would require funding, there are others which only require a change of policy. Congress should look to reinstate a former program allowing air traffic controllers to occupy the cockpit jump seats of our airliners. This program has successfully increased the controller's perspective of the operation for many years. Following 9-11 the program was terminated due to security concerns. With today's technology it is very simple for air carriers to properly identify an authorized air traffic controller and allow them to observe the operation. It is also possible to utilize the existing crew access system to provide an extra measure of security.

All of the above projects should be undertaken with the inclusion of the personnel who are involved with the implementation, in this case pilots and controllers. When the line personnel are involved at the outset, projects are generally completed in a more efficient manner, with a proper emphasis on human factors. There are numerous instances of employee associations contributing much value added to these projects. The pilot and controller unions are self funded to provide much needed user input into these complex systems.

Structural Certification Standards for Transport Category Aircraft

Aircraft certification standards must be reviewed with respect to structural integrity and crashworthiness. Flight 1549 demonstrates that an emphasis must be placed on ditching characteristics to ensure access to all slides/rafts following a water landing.

Current regulations (FAR part 25) mandate that aircraft will float in a position and a duration which will allow escape. It is assumed that the Airbus 320 met that standard, however, due to a structural failure the aircraft

floated for a time, but in a tail low attitude which rendered the two rear exits unusable. Equally significant is the fact that the escape slides/rafts associated with those two aft emergency exits were also unreachable. Access to either or both of the aft slides/rafts would have enabled the flight attendants to transport the rafts to one of the usable emergency exits in the forward portion of the aircraft. This would have provided much-needed raft capacity, especially for the passengers standing on a sinking wing in the frigid water. Current FARS mandate that raft capacity accommodate all occupants should the largest available raft be unavailable. This would not account for both rear rafts being unusable.

Heightened standards for structural integrity and crashworthiness will provide a safer environment for passengers who survive any type of accident or incident. Increased emphasis on aircraft ditching characteristics will ensure that aircraft integrity is guaranteed and that passengers surviving a water landing (ditching) will have access to all available slides/rafts on board the aircraft.

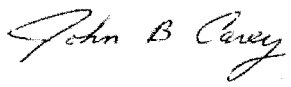
Regarding bird strikes, it appears that there may be some arbitrary standards being applied. While engine certification dictates several sizes of birds are tested, the empennage is required to withstand a strike from one eight pound bird. We believe that FAA should at a minimum explain that rational, such that a proper risk analysis may be applied to the entire aircraft.

Wild Life Hazard Mitigation

Presently under FAR part 139 an airport is required to establish a wildlife hazard mitigation plan only after an air carrier has had a serious encounter which causes substantial damage to the aircraft. This is a purely reactive requirement and Congress should encourage FAA to amend part 139 to require all airports to develop such a plan.

Research should be undertaken to determine current threat levels of wildlife hazards using up to date data, especially relevant to not only the numbers of birds, but size as well. Although there does not appear to be any one particular technological solution at hand, further research should be undertaken and current practices which are effective should be used across the system.

I would like to reiterate our commitment to enhancing aviation safety as this investigation goes forward, and thank the committee for the opportunity to provide this testimony.



John B. Carey
Chairman, Accident Investigation Committee
US Airline Pilots Association

STATEMENT OF MARGARET GILLIGAN, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION, BEFORE THE HOUSE OF REPRESENTATIVES COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, ON US AIRWAYS FLIGHT 1549. FEBRUARY 24, 2009.

Chairman Costello, Ranking Member Petri, Members of the Subcommittee:

Thank you for inviting the Federal Aviation Administration (FAA) here today to discuss the events surrounding the US Airways Flight 1549 emergency landing in the Hudson River on January 15, 2009. My name is Peggy Gilligan and I am the new Associate Administrator for Aviation Safety at the FAA.

This was a truly extraordinary event in aviation history: a multiple bird ingestion that virtually simultaneously caused engine failure in both engines of a commercial airliner on takeoff, resulting in an emergency water landing with no loss of life. While the FAA does have aircraft standards and crew training and procedures in place to address these issues, the circumstances of US Airways Flight 1549 were simply unprecedented, and we, just as the rest of the world, are awed by the quick thinking and consummate professionalism of the entire crew of Flight 1549.

Because the National Transportation Safety Board (NTSB) is still investigating the matter, my testimony today will primarily address the FAA's efforts in three areas: first, how the FAA works with airports to reduce the probability of bird strikes; second, what the FAA standards are for aircraft to increase survivability in crashes; and third, what the FAA requires in terms of flight crew training when encountering emergency situations such as this. I also want to note the role played by FAA air traffic controllers and flight

managers whenever an aircraft emergency develops, whether due, as here, to bird strikes, or some other cause.

Bird Strike Mitigation

Since 1990, the FAA has collected over 100,000 voluntary wildlife strike reports and has maintained a bird strike database. The Wildlife Services Program of the U.S. Department of Agriculture (USDA) manages the database under terms of an interagency agreement with FAA. Strike reports are sent to Wildlife Services where they are edited and entered into the database. Embry-Riddle University maintains the public FAA website for bird strike data.

Currently, the database has 106,604 records from January 1990 through August 2008. The increasing number of bird strikes is a combination of better reporting and increasing bird populations. The database is available to airport operators and safety analysts and is extremely useful for determining which species are most frequently involved in strikes, seasonal patterns, and extent and type of damage from strikes.

Mandatory reporting of wildlife strikes is extremely difficult to enforce and may not necessarily increase accurate reporting. The success of the voluntary reporting system is proven by the increase in annual reports from only 1,900 reported strikes in 1990, to almost 8,000 reported strikes in 2007. Advances in wildlife strike reporting through web-based technology make it easier and faster to report strikes. Moreover, the FAA, in close partnership with the USDA, continues to educate and increase awareness through

ongoing campaigns in concert with industry, conferences and participation on the national Bird Strike Committee.

The FAA has an interagency agreement with the Smithsonian Institution to analyze bird remains at the Feather Identification Laboratory (National Museum of Natural History) to determine species identifications. In 2003, the FAA purchased a DNA sequencer to assist in building a DNA library and improve the identification capability of the laboratory. Airports can mail small remains from bird strikes to the feather laboratory at the Smithsonian. The laboratory then analyzes the remains and provides the species information to the airport and the FAA Wildlife Strike Database. Species information is vital for the airports and wildlife managers when considering appropriate mitigation measures. Additionally, engineers use the data provided on species weights to test new engine designs. The Feather Identification Lab identified over 700 cases for the FAA in 2008.

Our statistics on bird strikes indicate that the closer the aircraft is to the runway, the higher the risk of a bird strike. Conversely, the risk of a substantial bird strike decreases significantly with altitude. High altitude strikes are not common, though they do occur. For instance, at 30,000 feet, there was only one reported bird strike, between 1990-2008. However, about 73% of all strikes occur within the airport environment up to 500 feet above ground. According to reports, Flight 1549 had reached an altitude of 3,200 feet when it encountered a flock of Canada geese that resulted in numerous bird strikes to the airframe and engines.

Since the data indicate that the greatest risk of bird strikes occurs at the airport, the FAA has focused its bird strike mitigation efforts at airports. By regulation, the FAA requires commercial service airports to maintain a safe operation. This includes conducting Wildlife Hazard Assessments and preparing a Wildlife Hazard Management Plan, if necessary.

Wildlife Assessment

As noted, a Wildlife Assessment is required of all commercial airports and requires consideration of wildlife attractants within 10,000 feet of an airport. FAA also recommends consideration of wildlife attractants (food, water, and habitat) within five miles of the airport, if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. The assessment considers:

- An analysis of events prompting the assessment
- Identification of wildlife species observed and their numbers, locations, and local movements
- Identification of features on or near the airport that attract wildlife
- A description of the wildlife hazards to air carrier operations
- Recommended actions for reducing wildlife hazards to air carrier operations

The Wildlife Assessment is submitted to the FAA. The agency then determines if the airport needs to develop a Wildlife Hazard Mitigation Plan.

Wildlife Hazard Mitigation Plan

Such a plan would:

- Provide measures to alleviate or eliminate wildlife hazards
- Identify persons who have authority for implementing the plan
- Identify priorities for needed habitat modification
- Identify resources for the plan
- Establish procedures to be followed during air carrier operations
- Outline wildlife control measures

Typical wildlife mitigation techniques include habitat modification, including filling in ponds and water sources, if practicable, and controlling vegetation, e.g., cutting grass high or low depending upon bird species. Airports may also use wildlife harassment tools, such as air guns, lasers, dogs, wildlife patrols, trapping and removing the wildlife, and as a last resort, exterminating the wildlife with the appropriate permits. Ongoing research into wildlife mitigation techniques continues to be explored by the USDA Wildlife Services program through an interagency agreement with the FAA.

Bird Radar Research

Additionally, in 2000, the FAA began research to determine if low cost radars can reliably detect birds at or near (within three to possibly five miles of) airports and be used to develop an airport bird strike advisory system. These systems generally work by overlaying the radar data on an airport geographic information system.

Bird detection radar may have the most promise as tools to help airport operators manage their wildlife control programs. However, as many airports routinely have birds in the area, we do not yet know if this system would be capable of providing alerts that would be operationally suitable for making specific time-critical decisions on landing or takeoff.

The research is continuing to address these operational type issues. We are conducting radar evaluations currently with two Bird Radar systems at Seattle-Tacoma International Airport, two Bird Radar systems at Naval Air Station Whidbey Island in Oak Harbor, WA, and one portable research radar unit that is owned/leased by the University of Illinois, currently finishing a brief deployment at YVR (Vancouver, British Columbia, Canada). We are planning additional testing at Chicago O'Hare, Dallas-Ft. Worth, and John F. Kennedy International Airports, starting later this year. The FAA plans to collaborate with the USDA Wildlife Services program during these additional radar testing phases to determine operational suitability of this technology at airports.

Aircraft Certification and "Survivability"

In addition to our bird strike mitigation efforts, the FAA certifies all civil aircraft to meet a series of minimum standards. To receive FAA approval, an aircraft must be airworthy -- that is, be designed and built to fly safely – as well as survive situations in which internal or external factors may interfere with safe operations of the aircraft. When the FAA certificated the Airbus A320, the design requirements and operating procedures

took into account numerous exigencies, including: flight into a flock of birds, emergency landings on land, loss of engine power, and emergency landings in water.

Engine Bird Ingestion

The A320 involved in Flight 1549 was powered by two CFM56-5B4/P engines, which were certified to meet these requirements:

- Flocking Birds — the engine was able to ingest a flock of birds (seven 1.5 lb. birds), not lose more than ¼ of its power and continue to run for five minutes at its takeoff power setting.
- Single Bird — the engine was able to ingest a single large bird (4 lbs.) and be able to shut down safely. When a large bird is ingested, no continued operation is required – essentially, the engine is designed to shut down, e.g., with no hazardous debris or fire.

Airplane Flotation

Even though landing in water is an extremely rare occurrence, all transport category airplanes must float long enough to permit all the occupants to escape. In addition, the A320 was certified for "ditching" – that is, a prepared emergency landing in water, meeting the following requirements:

- The airplane must float in such a way that there are sufficient exits above water.
- The plane must be able to land in water and float under reasonable conditions long enough to allow evacuation of passengers into life rafts.
- Structural damage that might occur as a result of landing in water must be considered when determining the flotation characteristics.
- The airplane must carry special equipment, such as rafts, life vests and survival kits.

Certification for ditching occurs when an airplane is intended to be operated

extensively on routes that are over water.

Seats

The seats on this airplane were designed to withstand 9 times the force of gravity, as are the overhead stowage compartments and other interior features. There are later standards that require dynamic testing of seats up to 16 times the force of gravity – commonly known as "16g seats;" however, these standards are not applicable to the A320.

What occurred to Flight 1549 indicates that all these standards were met. Current evidence points to engine bird ingestion of multiple Canada geese weighing on average between 6-10 lbs. each, far beyond the parameters of the birds for which the engine was designed to handle. Nonetheless, the engines reacted exactly as was intended; after the birds were ingested, they remained intact and did not shed any parts that might have damaged the aircraft fuselage; and they remained on the wing – allowing the crew to maintain flight.

Preliminary evidence indicates that the seats and all the interior structure performed very well in this accident, with minimal injuries to passengers as a direct result of the crash. Moreover, the aircraft did float – exits remained available and there was sufficient time for the successful evacuation of everyone on board.

Crew Training

In addition to our requirements for aircraft certification, Federal Aviation Regulations require all airlines to develop specific ditching procedures appropriate to their operations. Many airlines, including US Airways, tailor their training to their specific operations, with emphasis on areas of high risk. Airlines must submit these curricula to the FAA for review and approval before conducting any flight operations. Even though an airline may not spend extensive portions of its operations over water, it still has to have basic ditching training for its flight and cabin crews. Actual ditching training differs from airline to airline, based on the amount of their overwater operations.

The training is scenario based, meaning it includes a detailed dissection of an actual accident or incident and how the incident can be handled successfully. The crew is trained on all emergency procedures developed by the manufacturer, and this includes ditching. Training on handling emergencies -- crew resource management, decision making, workload management, crisis response, and situational awareness -- would be applicable to ditching through skill transfer, and that can be checked in a simulator. This scenario-based training and checking allows airlines to focus on events that are more likely to happen in actual, real-world operations.

Required ditching training includes emergency training with respect to each airplane type, model, and configuration for each required crewmember and each kind of operation that the airline proposes. All airline crewmembers must receive ditching training during their initial training and at recurrent intervals consistent with the airline's approved training program.

US Airways flight attendants receive initial and recurrent training in ditching procedures, including:

- Cabin preparations
- Raft drills
- Passenger preparations
- Evacuations

US Airways pilots receive ditching training at their initial indoctrination with the airline using a case study of a 1970 ditching by a DC-9, then later receive A320-specific instruction during recurrent training. Areas covered include:

- Aircraft "clean-up" (configuration for ditching)
- Communications with air traffic control and cabin crewmembers
- Crew resource management
- Ditching direction, based on wind or calm, swell direction
- Post-ditching procedures, e.g., signaling, survival, first-aid

The ditching procedures are broken into segments above 10,000 feet and below 10,000 feet. Crewmembers are trained on both procedures. The above-10,000 feet procedures are focused on troubleshooting and engine restart. The below-10,000 feet procedures focus on "cleaning up" the aircraft, preparing the cabin crew for a water evacuation, setting all the equipment and switches for ditching, and communicating with air traffic control. The crew is trained to use the applicable procedure.

Flight 1549

While the FAA has been working for decades on bird strike mitigation, improving aircraft to increase passenger survivability, and training pilots and crew for emergencies, none of that should take away from the extraordinary acts of this incredible crew. From Captain Chesley Sullenberger's strong background as a pilot and safety expert, which enabled him to control the aircraft so skillfully, to First Officer Jeffrey Skiles' efforts to restart the engines and initiate the emergency landing checklist, to the incredible professionalism of the flight attendants, Donna Dent, Doreen Welsh, and Sheila Dail, in instructing and guiding the passengers to safety, there will probably be no more storied, heroic aviation crew in history. The fact remains that for all the training and technological advances we might make, the human element is where it can all fail, or where it can astonish us all.

Every aviator from the onset of his or her aviation training is taught these priorities in order: "aviate, navigate, communicate" – to fly the airplane, first and foremost; to navigate to a suitable emergency landing area; and to communicate with air traffic control the nature of the emergency so rescue can occur. Captain Sullenberger and his crew responded admirably to their training and their instincts and aviated, navigated, and communicated to a successful conclusion.

At this juncture, I want to make sure that I point out the equally admirable work of, Patrick Harten, the air traffic controller who communicated with Captain Sullenberger during those harrowing moments. From clearing airspace and runways for an emergency landing, to calling upon other aircraft to be additional eyes, to alerting his colleagues of

the impending emergency, Mr. Harten was without doubt a crucial part of this incredible story. I also want to commend Michael Guarnieri, the air traffic controller at Teterboro, who instantly made a runway available at that airport in the event Flight 1549 was able to land there, and Robert Schmid, also at Teterboro, who did a great job of coordinating the emergency response notifications.

Our controllers are trained to respond to intense and stressful situations, as a matter of course. They have to be able to gather information from multiple sources, have constant situational awareness, and make instantaneous decisions. Every part of their training is designed to enhance each of these skills. It does not at all surprise the FAA that these controllers were so calm and professional in what was undoubtedly an incredibly pressurized situation, but once again, we are impressed with the high level of skill that these gentlemen displayed.

The incredible timeliness and efforts of the personnel on the commercial water vessels and other first responders who helped rescue the passengers and crew of Flight 1549 from the Hudson River that day was also extraordinary. From the ferries and tug boat crews to the New York City Fire and Police Departments, the combined efforts and quick thinking of all involved in getting the passengers and crew safely to shore were amazing and moving to see.

Finally, I must note that as we celebrate the outcome of Flight 1549, we also mourn the tragic loss of life on Colgan Air 3407 in Buffalo, New York. I know that the Members of this Committee will want to discuss this as soon as possible. We are fully supportive of

the ongoing NTSB investigation in that case and I want to assure you that we will always strive to provide you with the timeliest information possible.

Conclusion

Mr. Chairman, Members of the Subcommittee, this concludes my prepared remarks. I would be happy to answer any questions you may have.

U.S. House of Representatives
Committee on Transportation and Infrastructure

James L. Oberstar
Chairman

David Heymsfeld, Chief of Staff
Ward W. McCarragher, Chief Counsel

Washington, DC 20515

John L. Mica
Ranking Republican Member

James W. Coon II, Republican Chief of Staff

March 19, 2009

Ms. Margaret Gilligan
Associate Administrator for Aviation Safety
Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

Dear Ms. Gilligan:

On February 24, 2009, the Subcommittee on Aviation held a hearing on the "US Airways Flight 1549 Accident."

Attached are questions to answer for the record. I would appreciate receiving your written response by close of business on March 26, 2009 so that they may be made a part of the hearing record.

Sincerely,

Jerry F. Costello
Chairman
Subcommittee on Aviation

FEBRUARY 24, 2009
SUBCOMMITTEE ON AVIATION
HEARING ON
US AIRWAYS FLIGHT 1549 ACCIDENT

QUESTIONS FOR THE RECORD
TO:
Ms. Margaret Gilligan
Associate Administrator for Aviation Safety
Federal Aviation Administration

1. What avian radar system(s) is FAA currently testing with the University of Illinois, and what are its current capabilities?

2. Is the University's research examining one specific manufacturer's technology, or multiple manufacturers' technologies?

3. Has FAA considered avian radar technologies that are currently used by the U.S. Air Force, NASA, or other countries?

4. What is the timeline for deploying avian radar systems at airports that have been slated to receive it?

5. It is estimated that only 20 percent of bird strikes are reported to the FAA. Do you think it would be useful to require reporting to obtain a better data?

6. In your testimony you detail the training that US Airways flight attendants receive on ditching. Do other airlines have similar training exercises on ditching?

7. Captain John Prater noted in his written testimony that some airlines are removing water survival equipment from aircraft that do not fly extended distances from the shore. Please comment on this purported practice.

8. Following the ditching of Flight 1549 in the Hudson River, the aft raft slides were not available for passengers to exit into since the tail of the plane sank below the water line. Do you think it would be useful to revisit the issue of raft slide placement on aircraft?

February 24, 2009
Subcommittee on Aviation
Hearing on
US Airways Flight 1549 Accident

Responses To
Questions for the Record to:
Ms. Margaret Gilligan
Associate Administrator for Safety
Federal Aviation Administration

1. What avian radar system(s) is FAA currently testing with the University of Illinois, and what are its current capabilities?

The University of Illinois is currently assessing the performance of Accipiter Radar Technology Inc.'s Accipiter Avian Radar System at Seattle-Tacoma International Airport, and at Naval Air Station Whidbey Island in Oak Harbor, WA. Accipiter Avian Radar systems are capable of detecting and tracking bird targets within the vicinity surrounding the airport property defined by a radius of about 6 miles. With stacked parabolic dish antennas, Accipiter is capable of distinguishing altitude zones for target birds. With array antennas spinning in the vertical plane, the radar is capable of providing range and altitude information for targets. The system is capable of presenting the end user with a visual display of real-time target movements as well as historical track data over user defined periods of time.

Avian radar mapping allows analysis and identification of wildlife attractants and travel corridors. General limitations of avian radar include ground clutter (i.e. false readings/ interference), altitude discrimination, identification of species, and determination of target numbers/ size of flocks. Also, avian radar requires a person to be dedicated for interpretation of data.

2. Is the University's research examining one specific manufacturer's technology or multiple manufacturers' technologies?

The performance assessment effort was designed to assess the performance characteristics of commercially available avian radar systems. The University is currently assessing the Accipiter system and has been negotiating over many months for the inclusion of DeTect Inc.'s MERLIN avian radar system. The University has also been pursuing the establishment of working relationships with two other avian radar system manufacturers, GeoMarine Inc. (GMI) and TNO, a Dutch not for profit R&D organization in the Netherlands.

3. Has FAA considered avian radar technologies that are currently used by the U.S Air Force, NASA, or other countries?

The FAA has considered and continues to consider all avian radar technologies. The US Air Force and NASA currently utilize DeTect Inc.'s MERLIN avian radar system. The University of Illinois continues to negotiate with DeTect to evaluate the MERLIN radar. To date, we have been unable to reach an agreement as DeTect is seeking more control of the evaluation process and procedures than we normally include in our independent evaluations of research systems. As mentioned in #2 above, the University has also communicated with GeoMarine Inc. and TNO in hopes of establishing a working relationship to assess their ROBINLite avian radar system.

4. What is the time frame for deploying avian radar systems at airports that have been slated to receive it?

Seattle Tacoma, JFK, Chicago-O'Hare and Dallas Fort-Worth (DFW) International airports are included in our research project. Seattle's radars are deployed. Chicago O'Hare's research radars are on schedule for deployment by July 15, 2009. Research radar units have been received by JFK International as of March 17, 2009 and are on schedule for initial deployment activities to commence on April 6, 2009. There is potential for DFW to receive a different manufacturer's radar system (GMI or ROBINLite) as part of this study.

5. It is estimated that only 20% of bird strikes are reported to the FAA. Do you think it would be useful to require reporting to obtain a better data?

The FAA does not believe it would be useful to mandate strike reporting. The number of wildlife strikes voluntarily reported has increased 436% from 1,759 in 1990 to a record 7,666 in 2007. Factors involved with the annual increase in reporting from 1990 to 2007 include: an increase in aircraft operations; an increase in populations of hazardous wildlife species and; and increased awareness of the wildlife strike issue. Voluntary strike reporting has provided a database unparalleled that has directly assisted airports, wildlife biologists and the FAA to develop effective wildlife hazard mitigation plans.

Voluntary reporting conveys the expectation that the data will not be released to the public and that the data reporting is non-punitive. The release of airport specific data could be used to produce improper comparisons between airports and may result in a drop in reporting. Requiring bird strike reporting may require public release of all the data which is normally protected from release for voluntary reporting safety data. FAA has found that voluntary, non-punitive, protected reporting is an essential feature for advancing aviation safety. Mandatory programs frequently have a chilling effect on reporting.

6. In your testimony you detail the training that US Airways flight attendants receive on ditching. Do other airlines have similar training exercises on ditching?

Title 14 CFR section 121.417 requires training on emergency equipment, emergency procedures and emergency situations, applicable to the air carrier's operation. The type of ditching training differs depending on if the air carrier is engaged in extended overwater operations or not. Every air carrier trains its flight attendants on the location and use of ditching equipment, which may be flotation seat cushions, life preservers or life rafts, depending on the operation and the installed equipment. Each flight attendant must also receive hands-on training on the installed equipment. If an air carrier conducts extended overwater operations, the flight attendants must be trained on crew coordination, passenger briefing and cabin preparation, donning and inflation of life preservers, use of life-lines and boarding of passengers into life rafts. Typically this is conducted as "scenario-based" training. The FAA does not require "wet" ditching training, however many operators choose to conduct it. In its guidance material, the FAA recommends both "scenario-based" emergency training and the conduct of "wet" ditching training.

We looked at the flight attendant training program for the top 9 major carriers. The following carriers conduct extended, overwater operations and provide a "wet" ditching initial flight attendant training:

- American;
- Delta;
- USAirways;
- Northwest;
- Continental; and
- JetBlue.

United Airlines is approved for extended, overwater operations, but does not include a "wet" ditching drill in its flight attendant training.

Southwest and AirTran do not conduct extended, overwater operations and do not include a "wet" ditching drill in their training.

FAA's Office of Civil Aerospace Medicine (CAMI) reports that most airlines have sent personnel for its cabin safety workshops (including water evacuation and water survival). Some years many airlines send personnel; other years they do not, depending upon the airlines' amount of training funds. Since the Hudson accident, CAMI has seen an up-tick in smaller, regional carriers sending personnel to their cabin safety training. CAMI has also trained personnel in other government agencies in the cabin safety workshop, including the U.S. Marshals Service and Customs and Border Patrol (transport of inmates or illegal immigrants, respectively). In the past two years, 36 domestic airlines (see below), seven international airlines, and Boeing have sent personnel to CAMI for cabin safety training, which includes in-water training.

LIST OF DOMESTIC AND INTERNATIONAL AIRLINES PARTICIPATING IN CAMI CABIN SAFETY WORKSHOPS 2007-2009

U.S. Airlines		Foreign Airlines
Air Tran Airways	Lynx Aviation	Air Canada
Air Wisconsin	MAXJet Airways	Air Canada Jazz
Alaska Airlines	Mesa Air Group	Asiana Airlines
(Korea)		
Allegiant Air	Mesaba Air	El-Al Israel Airlines
American	Net Jets	Lan Airlines (Chile)
American Eagle	Northwest Airlines	Singapore Airlines
Atlantic South East	Pan Am	TACA (South
America)		
Cape Air	Republic Airlines	
Cape Air Nantucket Airlines	Republic Airways/	
	Shuttle America	
Champion Air	SkyWest	
Chautauqua Airlines	Southwest Airlines	
ComAir	Spirit Airlines	
Continental Airlines	Trans States Airlines	
Express Jet	UFLY Airways	
Freedom Airlines	United Airlines	
Gulfstream International Airlines	US Airways	
Horizon Air	USA3000	
JetBlue	Vision Airlines	

7. Captain John Prater noted in his written testimony that some airlines are removing water survival equipment from aircraft that do not fly extended distances from the shore. Please comment on this purported practice.

The regulation requiring equipment for extended overwater operations (life preservers, life rafts, a pyrotechnic signaling device, an emergency radio and a survival kit for each life raft) has permitted the FAA to allow deviation for a particular overwater operation, through the amendment of an air carrier's operations specifications. The FAA will consider a deviation to carry life rafts, and their associated equipment, but will not permit a deviation from the requirement to carry life preservers. The deviation will only be permitted for certain areas of operation adjacent to the contiguous 48 states, the Gulf of Mexico, and the Caribbean Islands.

When requesting a deviation, the air carrier must also document:

1) Aircraft operational capabilities for diversion due to an engine failure.
2) A graphical presentation of the areas and routes of en route operation and/or routes over which provisions of the deviation will apply.

3) Navigation and communication equipment requirements and capabilities for normal flight conditions and for engine inoperative flight conditions in the proposed areas of en route operation.
4) Existing and/or proposed procedures for diversion contingency planning and training curricula for flight and cabin crewmembers concerning ditching without liferafts.
5) A description of search and rescue facilities and capabilities for the proposed areas of en route operations.

8. Following the ditching of Flight 1549 in the Hudson River, the aft raft slides were not available for passengers to exit into since the tail of the plane sank below the water line. Do you think it would be useful to revisit the issue of raft slide placement on aircraft?

The issue of life raft placement is evaluated in context of the ditching event. The regulations require that the manufacturer determine which doors will be usable in a ditching event (e.g., above the waterline) and then install rafts near the exits from which they will be used. Structural and floatation tests and analyses are used to predict which doors will stay above the waterline. For the A320, the tests and analyses indicated that the rear exits would be usable. Therefore, we believe our efforts should be aimed at understanding why the structure failed in an unexpected manner, resulting in flooding of the aft of the airplane. We plan to examine the structure of the accident airplane to increase our understanding of ditching impact forces, and to improve the methods used for predicting which exits will be available.

As with most transport aircraft, slide/rafts in the A320 can be removed from their mountings and taken to a usable exit. This is verified during certification. This capability provides an additional level of safety, to help account for the variability in potential ditching conditions.

U.S. House of Representatives
Committee on Transportation and Infrastructure

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February 25, 2009

Ms. Margaret Gilligan
Associate Administrator for Safety
Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

Dear Ms. Gilligan:

On February 24, 2009, the Subcommittee on Aviation held a hearing on the **"US Airways Flight 1549 Accident."**

Attached are questions to answer for the record submitted by Rep. Michael E. McMahon. I would appreciate receiving your written response to these questions within 14 days so that they may be made a part of the hearing record.

Sincerely,

Jerry F. Costello
Chairman
Subcommittee on Aviation

JFC:pk
Attachment

FEBRUARY 24, 2009
SUBCOMMITTEE ON AVIATION
HEARING ON
"US AIRWAYS FLIGHT 1549 ACCIDENT"

QUESTIONS FOR THE RECORD
TO:

MS. MARGARET GILLIGAN
ASSOCIATE ADMINISTRATOR FOR SAFETY
FEDERAL AVIATION ADMINISTRATION

1. I understand that the FAA has been working with the Port Authority of NY and NJ on a new radar system at JFK Airport that can not only track bird migration patterns but develop formulas to determine future bird patterns, so as to better warn pilots and air traffic controllers. I understand that the Port Authority has asked the FAA to consider installing this pilot technology at LaGuardia – does the FAA support this request?

2. I believe that the FAA has installed an experimental bird radar system at Chicago O'Hare, Dallas/Fort Worth and Seattle/Tacoma airports – how effective have those radar systems been in detecting bird patterns around those airports?

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1. **I understand that the FAA has been working with the Port Authority of NY and NJ on a new radar system at JFK Airport that can not only track bird migration patterns but develop formulas to determine future bird patters, so as to better warn pilots and air traffic controllers. I understand that the Port Authority has asked the FAA to consider installing this pilot technology at LaGuardia – does the FAA support this request?**

Currently, the FAA is conducting research through the University of Illinois on bird radar technology. There are several manufacturers of bird radar systems and the FAA is determining each system's capability for the detection, tracking, and identification of birds, among other things. These studies will help the FAA create performance specifications and guidelines/protocols for their use.

By July 2009, four airports will be testing bird radar equipment. These airports are Seattle-Tacoma, John F. Kennedy, Dallas-Ft. Worth, and Chicago O'Hare International Airports. The FAA has initiated preliminary coordination with the Port Authority of NY and NJ at JFK for deployment of a radar system. However, there are currently limitations on this technology in that it cannot make positive species identification nor an accurate determination of bird numbers; neither can it give an accurate measurement of altitude and distance from a particular object.

Out of the three airports that the Port Authority oversees, the FAA and the Port Authority worked together to select JFK as an initial test site. JFK was ideal for testing because of its large volume of air traffic, its proximity to a wildlife sanctuary, and its proximity to the other New York area airports. The information collected at JFK will be valuable data that the Port Authority can apply to each of its airports, including LaGuardia.

Shortly after the US Airways Flight 1549 crash, the Port Authority did request that the bird radar be installed at all three of its airports. However, since then, the FAA has briefed the Port Authority on the limitations of the radar and its current limited effectiveness in helping to prevent such a crash. LaGuardia may be a viable location for future installation of bird detection technologies as they become available.

2. **I believe that the FAA has installed an experimental bird radar system at Chicago O'Hare, Dallas/Fort Worth and Seattle/Tacoma airports – how effective have those radar systems been in detecting bird patters around those airports?**

The FAA has not yet installed any bird radar systems at Chicago O'Hare or Dallas/Ft. Worth. We are scheduled to begin testing bird radar systems at O'Hare and DFW later this summer. At Sea-Tac, the FAA is testing a system by Sicom. This system has allowed wildlife professionals to track birds 24 hours, 7 days per week out to 6 miles from the airport and up to 3,000 feet, where they previously could not see with the naked eye. Although the system shows great promise and has aided wildlife management efforts at the airport, there is still much testing and evaluation to be done before standards can be developed by the FAA for the incorporation of avian radar systems at commercial airports. As noted above, limitations include positive species identification, accurate determination of bird numbers as well as altitude and distance to the detected object.

As we are learning in Seattle, current bird radar technology allows airports to assess real time events and monitor trends over time, which can improve existing mitigation programs. However, bird radar sites need qualified by on-site experts to evaluate and interpret the data. Currently, there are limitations to existing bird radar detection technology such as determining types and numbers of birds, and current radars do not yet provide the accuracy and adequacy of data to assist with effective civil air traffic control mitigation. Most bird detection radars are based on existing marine radar technology and were not originally designed to detect and track birds. Other concerns such as ground clutter, which that can mask bird movements, must be resolved.

Testimony by Patrick Harten, Air Traffic Controller
Before the Transportation & Infrastructure Subcommittee on Aviation
US Airways Flight 1549 Accident
February 24, 2009

Good morning Chairman Costello and Ranking Member Petri. My name is Patrick Harten.

I have been an air traffic controller at the NY TRACON and a proud member of the National Air Traffic Controllers Association for the past 10 years.

While January 15, 2009 is forever etched in my memory, it began unremarkably. I arrived at work at 12:30pm to begin my eight-hour shift.

At 3:12 PM I was assigned to work the LaGuardia (LGA) departure RADAR position. This position handles all departures from LGA airport.

At 3:25 PM, the LGA tower controller advised me that Cactus 1549 was the next departure rolling for takeoff.

It was a routine westbound departure off of Runway 4 traveling due north on a 360 degree heading and climbing to 5,000 feet.

I instructed Cactus to climb to 15,000 and turned my attention to give instructions to another aircraft under my control.

I then turned back to Cactus 1549 and instructed him to turn left to heading 270, heading the aircraft towards its destination. That is when the Captain advised me that they suffered a bird strike, lost thrust in both engines, and needed to return to LGA for an emergency landing.

When a pilot tells a controller he needs to make an emergency landing, the controller must act quickly and decisively.

I made a split second decision to offer him Runway 13, which was the closest runway to his current position and turned him left at a 220 heading so he could return to the airport.

I then immediately contacted LGA tower to ask them to stop departures and clear the runways for an emergency return.

While I have worked 10 or 12 emergencies over the course of my career, I have never worked an aircraft with zero thrust capabilities. I understood how grave this situation was.

After I gave him his instructions, the Captain very calmly stated: "We're unable."

I quickly vectored an aircraft that was still in my airspace and then gave 1549 a second option: land on LGA Runway 31.

Again the Captain said, "Unable."

I then asked the Captain what he needed to do to land safely. At this point, my job was to coordinate and arrange for the pilot to be able to do whatever was necessary.

The pilot told me that he could not land on any runway at LGA, but asked if he could land in New Jersey and suggested Teterboro.

I had experienced working traffic into TEB from my time working in the EWR sector and after coordinating with the controllers in TEB, we were able to determine that Runway 1 was the best option. It was the arrival runway, and clearing it for an emergency landing would be easier and faster. It also meant that 1549 would be landing into the wind, which could have assisted the pilot in making a safe landing. I called TEB and explained the situation. The controller at TEB reacted quickly and prepared Runway 1 for the emergency landing.

I then instructed the Captain to turn right on a 280 heading to land on Runway 1.

The Captain replied: "We can't do it."

I replied immediately, "Which runway would you like at Teterboro?"

The captain replied: "We're gonna be in the Hudson."

I asked him to repeat himself, even though I heard him just fine. I simply could not wrap my mind around those words. People don't survive landings on the Hudson River; I thought it was his own death sentence. I believed at that moment, I was going to be the last person to talk to anyone on that plane alive.

I then lost radio contact with 1549, and the target disappeared from my radar screen as he dropped below the tops of the New York City skyscrapers. I was in shock. I was sure the plane had gone down.

Less than a minute later, 1549 flickered back onto my radar scope. The aircraft was at a very low altitude, but its return to radar coverage meant that there was a possibility 1549 had regained the use of one of its engines.

Grasping at that tiny glimmer of hope, I told 1549 that it could land at EWR seven miles away on Runway 29, but I received no response. I then lost radar contact again, this time for good.

I was relieved from my position a few minutes later, as soon as it was possible. I was in no position to continue to work air traffic. It was the lowest low I had ever felt. I wanted to talk to my wife. But I knew if I tried to speak or even heard her voice, I would fall apart completely.

I settled for a hasty text message: "Had a Crash. Not ok. Can't talk now." When I got home, she told me she thought I had been in a car accident. Truth was I felt like I'd been hit by a bus.

It took six hours before I could leave the facility. I had to review the tapes, fill out paperwork and make an official statement.

It may sound strange, but for me the hardest and most traumatic part of the entire event was when it was over.

During the emergency itself, I was hyper-focused. I had no choice but to think and act quickly, and remain calm. But when it was over, it hit me hard. It felt like hours before I learned about the heroic water landing that Captain Sullenberger and his crew had managed. Even after I learned the truth, I could not shake the image of tragedy in my mind. Every time I saw the survivors on the television, I imagined grieving widows.

It has taken over a month for me to be able to see that I did a good job; I was flexible and responsive, I listened to what the pilot said and made sure to give him the tools he needed. I stayed calm and in control.

I return to work this week, and while it may take time for me to regain my old confidence; I know I will get there. I would like to end by personally recognizing the Captain and crew of Flight 1549 for their professionalism, skill and heroic efforts that day. I also would like to recognize the professionalism of the other controllers who helped clear the skies and the runways for 1549, as well as the engineers, who helped ensure that the aircraft itself could survive the landing in the Hudson and that those inside would be safe.

Finally, I want to thank my wife Regina. She has been my rock these past few weeks—as she always has and always will be. I couldn't have survived this without her.

Thank you Mr. Chairman. I am prepared to answer any questions you have.

TESTIMONY OF

CANDACE K. KOLANDER
COORDINATOR, AIR SAFETY, HEALTH AND SECURITY

ASSOCIATION OF FLIGHT ATTENDANTS – CWA, AFL-CIO

BEFORE

THE SUBCOMMITTEE ON AVIATION OF THE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, DC

FEBRUARY 24TH, 2009

Association of Flight Attendants – CWA, AFL-CIO
501 Third St. NW
Washington, DC 20016
202-434-1300

Thank you, Chairman Costello and Ranking member Petri for giving us the opportunity to testify today. My name is Candace Kolander and I am the Air Safety, Health and Security Coordinator for the Association of Flight Attendants – CWA (AFA-CWA) and served as a flight attendant at Aloha Airlines for 21 years. AFA-CWA is the world's largest flight attendant union, representing over 55,000 flight attendants at 20 airlines. I especially want to thank the Committee for giving our members from US Airways Flight 1549 the opportunity to tell their story today. I know that you are all as proud of them as we are. They are a true testament to the strength and resilience of all flight attendants that love this profession and take seriously our role as aviation safety professionals.

While they, and those flight attendants onboard Continental Airlines Flight 1404 last December, and hundreds of other flight attendants over the years have performed their primary safety responsibilities in emergency situations admirably, we are sadly reminded from the recent Continental Connection Flight 3407 accident in Buffalo operated by Colgan Air that our chosen career does pose a daily risk. Our thoughts and prayers over the last week have been with our colleagues at Colgan and all their friends and families that mourn the loss of two of our flight attendant family – Matilda Quintero and Donna Prisco.

The evacuation of Flight 1549 reminded everyone around the world in stunning fashion, just exactly what the role and purpose of flight attendants are – inflight safety professionals. Years of cultural attitudes have often relegated flight attendants to nothing more than "servers in the sky" in the eyes of some. In fact, airline management itself often seems intent on pushing this attitude further by adding more and more "customer service" type training for flight attendants, often at the neglect of important safety and security training. But the whole world has been reminded once again, through the actions of the three flight attendants you just heard from, of the importance of the true job responsibilities of flight attendants – to protect the aircraft's passengers and ensure their safety.

This is an important fact that Congress itself recognized in the last FAA Reauthorization legislation – Vision 100, when you required that flight attendants be certified as safety professionals. Until this Committee ensured that we would be certified for completing our safety training programs, everyone from the parachute packers to the pilots received certification after completion of their training, except for flight attendants. The certification that you required through Vision 100 was an important step in recognizing the professional safety role that flight attendants serve. We will forever be grateful to Congress for taking action on this long plight for professional respect.

Recently, we secured another important milestone in our efforts to formally recognize flight attendants as vital safety professionals when the Department of Labor (DOL) responded to AFA-CWA's formal comments and reclassified the flight attendant occupation to its rightful place. The DOL's Bureau of Labor Statistics maintains a Standard Occupation Classification (SOC) system in which every occupation is assigned to a certain category. Flight attendants had been listed in the personal care providers' category, along with professionals such as animal trainers, hairdressers, funeral attendants and fitness trainers. AFA-CWA has long disagreed with this classification and has worked to reclassify our profession with our fellow crew members and transportation workers. For the first time in over 30 years, flight attendants will now be listed with essential transportation workers such as pilots and air traffic controllers in the Transportation and Material Moving Occupation section.

The SOC is frequently used by government agencies when compiling and comparing employment data. AFA-CWA made the claim to the Department of Labor to re-evaluate the flight attendant classification after first securing flight attendant certification with the FAA thanks to the actions of Congress. This AFA-CWA victory in raising the profile of flight attendants is yet another step in the evolution of our profession to gain recognition from all levels of government and the public as safety professionals.

As the only safety professionals required in the cabin on passenger aircraft, we know that we provide a unique perspective on steps that have been taken to improve aviation safety

over the years and can give insight on important steps that still must be taken. For decades, AFA-CWA has been at the forefront calling for, and helping develop, improvements that have been made to ensure that our workplace – the passenger aircraft cabin – is as safe as it can be. We have been requested to appear before this Committee and others on a range of aviation safety issues many times, going back several decades. Besides the advice and expertise we have been called upon to provide to Congress, AFA-CWA has been an integral part of accident investigations going back to the mid 1950's and AFA-CWA has played a key role in developing the recommendations from those investigations. Congress and the National Transportation Safety Board have all recognized something that Iris Peterson, the first female flight attendant to take part in an accident scene investigation told me, "It is, after all, an advantage to everyone to have a flight attendant participate in an investigation because no one knows the aircraft cabin better than a flight attendant."

Some of our recommendations throughout the years have been implemented either through legislative action or changes at the FAA. Some have taken longer than we had hoped or not been as thorough. And many more are still in need of being addressed. As aviation safety professionals, that always have the safety of our passengers in the forefront of our minds, we remain committed to diligently and persistently doing everything we can to ensure that all necessary steps are taken to improve survivability in an emergency situation.

As the recent fatal crash in Buffalo reminds us, we need to remain forever vigilant in efforts to improve survivability and overall safety. We are fortunate that the accident rate has decreased and have seen overall survivability in airline incidents increase. But that does not mean that we should stop trying to make design or operational changes to improve safety or become complacent with the current record.

Specifically in the area of improvements that have benefited overall safety, we have seen a number of changes in design standards that we believe have been important steps towards improving survivability and decreasing injuries. AFA-CWA has been a vocal

proponent of these improvements. Among them are less flammable cabin material, requirements for floor level exit lights and requirements for 16g seats in all newly manufactured aircraft after October 2009.

Flammability Standards

There has been a great deal of attention given to regulations that govern fire safety. Fire onboard the aircraft during flight can have devastating consequences as we have seen in accidents like Swissair Flight 111 which crashed into the Atlantic Ocean southwest of Halifax International Airport on September 2, 1998. The accident investigation found that an inflight fire involving faulty wiring and flammable material used in the aircraft's structure propagated the fire to spread beyond the control of the crew. The spreading fire degraded aircraft systems and eventually led to a loss of control of the aircraft and the loss of 215 passengers and 14 crew.

Fire on the ground can be just as deadly particularly if it occurs as a result of a take-off or landing accident. Structural damage can occur to the fuselage or to the engines resulting in a post-crash external fuel-fed fire. Assume that the fire is about to enter the cabin and you have less than 90 seconds to get out of the aircraft. One of the key factors to your survival is the performance of the flight attendants in assessing outside conditions, initiating an evacuation, opening the exits and deploying slides, assisting passengers out of the aircraft, and dealing with the many unpredictable events of the crash. The other key factor in your survival in a fire situation onboard an aircraft is reducing the speed at which interior materials burn and reducing smoke and toxic gas.

A 1985 Notice of Proposed Rulemaking (NPRM No. 85-10) issued by the FAA hoped to enhance survivability of occupants by upgrading the flammability standards for materials used in the interiors of transport category airplanes as well as a testing method and apparatus to be used to show compliance with the new design standards. The improved flammability standard specified that interior ceiling and wall panels (other than lighting lenses), partitions, and the outer surfaces of galleys, large cabinets and stowage compartments (other than under seat stowage compartments and compartments for

stowing small items such as magazines and maps) must meet the new standards. The standard specified maximum heat release rates, and smoke testing provisions as well as addressing burn properties such as how quickly an image ignites. The standard was for airplanes type certificated after 1985, and required that cabin interiors of current use aircraft at the time, would not need to comply with the new criteria until the first replacement of the cabin interior.

On February 1, 1991, USAir Flight 1493, a Boeing 737-300, was landing at the Los Angeles International Airport at the same time Skywest flight 5569, a Fairchild Metroliner, was waiting on the same runway for takeoff. Both airplanes were destroyed due to the collision. All 10 passengers and 2 crewmembers aboard the Metroliner and 20 passengers and 2 crewmembers aboard the USAir airplane were killed. The NTSB accident report notes that many "passengers stated that the cabin filled with thick black smoke within seconds of the impact..." The report notes that passengers perished in the aisle possible waiting to exit through the row 10 exits. "They perished as a result of smoke and particulate inhalation, strongly suggesting that they were able to make their way, possible guided by the floor path emergency lights, to the overwing area from as far away as the forward cabin." (NTSB/AAR-91/08, page 65)

The Boeing accident aircraft was manufactured before the effective date of the flammability standard requirement for materials used in the interior of the aircraft and therefore any retrofit of fire retardant cabin furnishings was only required in the event of a general retrofit of the interior at a later time.

In addition to the focus on flammability of interior materials, other fire safety improvements implemented in the 1990s were geared to improving the survivability in a fire situation. On May 16, 1991 the FAA required that transport category airplanes have:

> (1) Each lavatory in an airplane with a passenger seating capacity of 20 or more to be equipped with a smoke detector system that provides a warning to the cockpit or to the passenger cabin crew;

(2) each lavatory trash receptacle in an airplane with a seating capacity of 20 or more to be equipped with a fire extinguisher that discharges automatically upon the occurrence of a fire within the receptacle;
(3) the number of hand fires extinguishers in the cabins of airplanes with passenger seating capacities greater than 200 to be increased;
(4) a specified number of the hand fire extinguishers in the cabin to contain Halon 1211 or equivalent as the extinguishing agent; and
(5) one hand fire extinguisher in each galley that is located above or below the passenger compartment.

Emergency Floor Lighting Systems

Another improvement made to enhance emergency evacuation is the requirement that aircraft be equipped with floor proximity emergency escape path marking. As mentioned above, fire and smoke in the aircraft cabin can have a devastating effect. Getting to an emergency exit as quickly and as safely as possible is a key factor in surviving an aircraft crash. To assist in finding emergency exits passengers would follow the verbal commands from flight attendants and the visual cues from emergency lighting systems as directional aids. Emergency lighting had been required on the aircraft for many years but the source of this emergency illumination was typically from overhead lights. In 1984 a new requirement was added that established a floor proximity emergency escape path marking to provide visual guidance for emergency cabin evacuation when all sources of cabin lighting more than 4 feet about the aisle floor are totally obscured by smoke. This new design requirement was in addition to the older emergency lighting standards. The floor level lighting was designed to improve safety in an evacuation.

16g Seats

Another critical factor in aviation safety in addition to the less flammable cabin interiors and the emergency egress lighting systems is the design of seats. The effort to improve the aircraft seat began as a requirement under Senator Metzenbaum's amendment to the Airport and Airway Safety Act and Capacity Expansion Act of 1987. That requirement forced the DOT/FAA to "initiate rulemaking proceeding to consider all seats on board all

air carrier aircraft to meet improved crashworthiness standards based upon the best available testing standards for crashworthiness" within 120 days after the date of the enactment of the Act on December 30, 1987. In its Notice of Proposed Rulemaking No. 88-8, issued in May, 1988, the FAA stated that it was continuing, "with renewed vigor," the effort to provide for the retrofit of improved seats in the air transportation fleet. Notice 88-8 proposed to prohibit the operation of transport category airplanes after June 16, 1995 unless all seats onboard met the new certification standards. The proposed upgraded certification standards would require a more sophisticated and complex testing of a 16g seat. The 16g seat was tested under a process called dynamic testing and was an improved process over the older 9g seats which relied on static pull tests for their certification. A 16g seat basically means that it is designed to absorb crash forces equivalent to 16 times the force of gravity and stay in place. The standard was designed to improve occupant protection in impact-survivable accidents.

From 1988 to the mid-to-late 1990s the FAA collected public comments, held industry meetings, working group meetings and held a public meeting to further discuss this important safety improvement. The industry argued that more information was needed to determine the impact of this proposed new rule. The 1988 proposed rulemaking was never closed while the FAA considered what do to next on the safety issue.

One of the industry arguments we heard at the time claimed that an accident prevention program somehow lessens the importance of providing state-of-the-art crash injury protection to the public. "Prevention" has long been accepted as the preferred option to "participation" in any hazardous event. But, concurrent with that philosophy is the practical recognition that "preparation" for participation in the hazardous event is ultimately necessary for those instances where "prevention" fails. Numerous examples come to mind. The State Department works to prevent war, but the Defense Department must be prepared to fight and win if prevention fails. Improved sanitation, personal hygiene, and good health practices are developed to prevent illness, but we work to assure the availability of the best available medical practitioners and medicines for those all-too-common instances when those prevention methods fail. Installation of the "16g"

seats in all transport airplanes is an essential element of preparation for the crash that can result when accident prevention fails.

In 1998, ten years after the FAA proposed but never issued a rule to require installation of 16g seats on existing aircraft types, the docket on Notice 88-8 for 16g seats was reopened for public comment. Subsequently on October 4, 2002 the FAA published a supplemental notice of proposed rulemaking (SNPRM) that again would require 16g passenger seats onboard certain manufactured aircraft. This SNPRM also included the requirement that flight attendant seats meet the 16g design standards. AFA-CWA welcomed this addition to the SNPRM as our workplace seats were not included in the original proposals for improved seat safety. This SNPRM also required that on or after 14 years after the effective date of the final rule that all transport category aircraft had to have passenger and flight attendant seats that complied with the new requirements. This was known as the retrofit requirement.

Above is just a highlight of some of the requirements in the 2002 SNPRM, there were others. Some of these requirements changed when the "final" rule on 16g seats was published. The FAA issued the final rule on "Improved Seats in air Carrier Transport Category Airplanes" on September 27, 2005. The final rule required passenger and flight attendant seats to meet the improved crashworthiness standards, 16g seats for those airplanes type-certificated after January 1, 1958 which have not yet been manufactured. Newer aircraft that have a type design basis after 1988, such as the Boeing 777 and the Boeing 787, would not be affected by this rule because they were designed to meet the revised emergency landing conditions which included dynamic landing conditions.

The implementation of this cabin occupant safety improvement has been sluggish to say the least and fraught with procrastination at many levels. We welcome the fact that transport category airplanes manufactured on and after October 27, 2009 when used in part 121 passenger carrying operations must comply with the rule for improved seat crashworthiness and occupant safety.

Exit Row Seating

One of the important rules to have been implemented by the FAA that has led to greater odds of survivability is the one regarding exit row seating. In 1990, the FAA issued a final rule listing requirements for passengers allowed to sit in the emergency exit rows. It required that an airline can only allow passengers able to perform the required safety functions in an emergency situation to sit in those seats. Those functions identified as important were:

1) A passenger must be able to locate the emergency exit door and quickly follow the instructions, written and oral, for its use. Door operations and instructions differ from aircraft to aircraft. A delay in figuring out how to operate the door can cost precious seconds; operating it improperly can injure or result in the death of passengers.
2) A passenger must be able to physically open the door. Doors are often heavy and clumsy to manipulate, and not every passenger can open them quickly.
3) A passenger must be able to determine when to open the door. This involves being able to respond to shouted or hand-signaled instructions from flight attendants, as well as being able to tell when opening an exit would be too dangerous.
4) A passenger must be able to go quickly through the open exit, in order not to cause a traffic jam at the door, and perhaps to assist other passengers to leave the danger zone around the aircraft.
5) A passenger must devote full attention to his or her emergency task. A passenger who must care for small children, for example, may be unable to do so.

Anyone flying and seated in an exit row is no doubt familiar with these requirements and the briefing required by flight attendants to those seated in those exit rows. Among them is an assessment that the passenger must be physically capable to open and remove the emergency exit door, that they must be over the age of 15 and that they must be able to read and understand the instructions regarding evacuation procedures and understand commands in the English language.

These requirements were important in increasing the overall odds of survivability as they improve the likelihood of ensuring that anyone occupying the seats at these emergency exits will be able to help effectively in an evacuation. Flight attendants cannot be at all emergency exit doors. In most emergency situations, the speed of evacuating an aircraft is critical. Mere seconds can be the difference between life and death. By ensuring that those occupying these seats are capable to quickly and efficiently open the exit doors and assist in a quick evacuation is an important improvement in maximizing passengers' chances of getting off an aircraft alive.

Crew Resource Management (CRM)

The aviation community has readily accepted that Crew Resource Management (CRM) concepts and training can lead to improvements in aviation safety. With CRM's emphasis on communications and teamwork, pilots and flight attendants are better equipped to work together to improve safety, security and passenger service. However, as with any management system, we must always be wary of complacency, and continuously evaluate our CRM programs to ensure that goals are met as the marketplace evolves.

For example, some of the new security measures that have been adopted in commercial aviation post-September 11, 2001 compel a re-examination of the communication methods integral to CRM. One specific area is in relation to the installation of the new reinforced flight deck door and its associated procedures. At some airlines, the locked door is hindering the traditional forms of communication that have existed between the flight deck crew and the flight attendants. The strides that have been made in the past relative to ensuring the "team" mentality between the flight deck and cabin crew are in jeopardy of being lost if we don't proactively look at the issue. In order to evaluate the effects of the locked flight deck door, we need to review the history of Crew Resource Management in aviation.

The first courses in CRM were in "cockpit" resource management. Early accident trends were on the rise until around the 1960s when we then saw the accident rates leveling off from the 1970's onward. Part of the accident decline was attributed to better equipment and better training on the technical aspects of flying. These two things were not enough though, as crew-related actions such as poor decision making, ineffective communication and inadequate leadership and task management were contributing factors in 60 to 80 percent of accidents and incidents, according to the U.S. Federal Aviation Administration's (FAA) Advisory Circular (AC) 120-51E. Therefore, in the mid-1980s, we saw "Cockpit" Resource Management training adopted at some airlines.

Eventually deficient crew communications from the cabin to the flight deck were cited as contributing factors in accidents and incidents. One example was the March 1989 Air Ontario Fokker F-28 which crashed on takeoff in Dryden, Ontario, resulting in 24 fatalities. The accident investigation found that the flight attendants did not tell the pilots that there was wet snow building up on the wing. The flight attendant had been reluctant to report, because in the past when she had related safety concerns to pilots, they did not welcome the information. She also assumed that the pilots were aware of exactly what was happening and that she should not second guess that they had all the information.

A similar failure of the cabin crew to communicate safety information was also evident in the January 1989 British Midlands Boeing 737 accident. During the take-off roll a fan blade fractured the No 1 engine (left). The pilots, however, thought that the No 2 engine (right) had been damaged. The flight attendants and passengers could see fire on the left engine but the pilots were never informed. The error went uncorrected and the only good engine was subsequently shut down. Forty-seven of the 126 occupants died.

One of the primary focuses of CRM is effective team coordination. Flight attendants offer an important information resource; thereby expanding the eyes and ears of the pilots. The more the two crew components act as a team, the more likely that passengers will have a better experience and safety of flight will be enhanced. The two examples above clearly showed that the "team" philosophy had broken down. Eventually, "Cockpit"

Resource Management expanded into the cabin and other operational areas, so that it is now appropriately termed Crew Resource Management. CRM now incorporates the entire flight operations team, including the pilots, flight attendants, dispatchers, air traffic controllers, maintenance and others.

Two Cultural and Geographical Environments

CRM training makes a major contribution to safety by building on teamwork between the cabin and flight deck crews, during both normal and emergency operations. CRM teaches crewmembers to utilize effectively all resources available to the crew (e.g. hardware, software and other individuals) to achieve a safe flight.

The commercial airliner has long been divided into two cultural and geographical environments: the flight deck and the cabin.

My predecessors were "skygirls" who had to be registered nurses, single, childless females under the age of 25, and under the weight of 115 pounds. They were hired to quell the nervousness of new fliers on those long, arduous journeys that sometimes took between 18 and 24 hours to complete, in an airplane that was not pressurized, heated or air-conditioned. We were onboard the aircraft for practical reasons but marketing played a large role also. Compliance and sociability in the 1930s were important attributes in skygirls. Pilots by contrast evolved from the 1920s stunt pilots and aerialists. These "barnstormers" performed almost any trick or feat with an airplane that people could imagine. They also took the role of ensuring that the coast-to-coast air mail flights of the 1920s were successful.

These differing cultural differences, one dedicated to public service and trained to be marketing driven and the other dedicated to the operation of machinery and proficient in technical matters, have been imbued by tradition and airline management and are still somewhat present today.

In addition to the cultural barriers between cabin and flight deck, there is also the physical barrier that has been there for years, the flight deck door. The flight attendants can be even further divided themselves by the class in the cabin they are working, either first class, business or coach. In a sense, there may be two or more teams in the cabin; with the pilots behind the flight deck door the potential for a fragmented onboard crew is high.

Besides the physical partitions, another layer that separates the onboard team is the administrative rostering or scheduling of the pilots versus the flight attendants, as these rotations might not follow the same pattern. This is especially true if the duty and rest regulations for the pilots and flight attendants differ. For example, cabin and flight deck crews could fly together for a series of flights, then head in different directions. In the U.S., some of our pilot and flight attendants don't even stay in the same hotel, which is another factor that separates the two teams.

September 11 Security Measures Added

After September 11, 2001 the U.S. and other countries responded to the aviation threat that aircraft could be used as weapons. Aviation security needed to be revised and strengthened to meet the newest threats. In the area of airport security the screening of passengers and belongings needed to be improved; identification and validation of persons having access to secured areas of the airport and to aircraft needed to be updated and strengthened; and more effective security measures need to be included in any future airport construction, just to name a few.

Inside the aircraft, training was redesigned to address the new threat and incorporate a new philosophy in the way a crew was to respond to a terrorist attack. In terms of physical infrastructure, new reinforced flight deck doors were also mandated. There have always been doors that could be used to separate the flight deck and cabin crews, but the reinforced door is a much more substantial barrier than the old door. The reinforced doors are designed to stop, or at least delay, forced intrusions and to resist ballistic

penetrations and small cabin explosions. These doors have hardened locks that in many cases can only be opened using an entry code. No longer can flight attendants use a key to enter the flight deck. Those keys have been destroyed with the intent to keep terrorists out; unfortunately, flight attendants are also kept out. Furthermore, in addition to being a physical barrier, the locked door is also a psychological barrier that discourages an open stream of communication.

The locked door also forces flight attendants to handle more issues and make more decisions on their own. No longer does an additional flight deck crew member come out of the flight deck and assist in the cabin. Even with the emergence of the two-pilot crew, one of the pilots would typically come into the cabin to help handle a situation if they felt it necessary. That is, prior to September 11.

Operational changes restricting access to the flight deck during flight were also required to strengthen security. The basic philosophy is the flight deck, and its pilot occupants, need to be protected at all times, by prohibiting unknown individuals from gaining entry to the flight deck. That means limiting the number of times crew enter or exit the flight deck, with the entry and exit process done as quickly as possible. And before even opening the door, the flight attendant needs to ensure there is a clear zone in the cabin sections adjacent to the door.

Prior to this operational change due to security the flight attendants may have gone up to the flight deck several times to give a status report on a situation in the cabin or to let them know about something odd happening in the cabin even though it was not a concern yet. Or they could simply have gone up there to talk during a slow cabin service period. Such informal bonding has been a significant part of CRM; unfortunately, the new operational changes now discourage such activities, creating another psychological barrier.

Our method of communication with the pilots after September 11 is now limited to the interphone system. Entering the flight deck to have a face-to-face conversation with the

pilots to tell them about a possible problem passenger is no longer an acceptable practice, given that the problem passenger could be a ruse to get the flight attendant to open the flight deck door.

Our direct interaction with pilots is now reduced to merely fulfilling specific requests such as delivering food and drinks, and minimal contact when they need to exit and re-enter the flight deck for bathroom breaks. And that interaction is usually only performed by the flight attendant stationed closest to the door. On a given long haul flight, we may only see the pilots twice, when delivering meals or picking them up. On short haul flights the communication may be even more limited, because of the need to maintain sterile cockpits and the fact that flight attendants are not necessarily delivering any meals up front.

Communicating with the interphone can sometimes be problematic due to static on the line making understanding difficult. In situations like this, face-to-face conversation could help alleviate any mis-communication. In discussing interphone communications with flight attendant safety representatives, I was told about a very interesting situation at one airline. At this carrier the pilots have requested that the flight attendants not use the interphone on one particular aircraft type and model, because when the interphone rings in the flight deck it is very loud and startles them. In spite of this request, about half the flight attendants call them anyway because it is SOP (standard operating procedure) at their carrier to use the interphone for all communications. Those flight attendants are of the mind set that it is just "too bad, so sad, deal with the noise." However, we have also been told that other flight attendants do comply with the pilot request to not use the interphone system, so much so that they actually refrain from calling the flight deck even when there may be an issue in the cabin.

All these factors are affecting the relationship between the flight attendants and the pilots and can affect the overall performance of the crew as a team. The front-end crew / back-end crew mentality is returning, further undermining the benefits of CRM.

Is There a Solution?

CRM training has been conceived to prevent aviation accidents by improving crew performance through better interpersonal skills, leadership style, communication, crew coordination, planning, briefing, workload management, decision making, error management, risk identification and management techniques.

In the past at my airline, part of our new hire training for flight attendants included a ride in the flight deck during take-off and landing to familiarize them with the work environment and to get a better understanding and awareness of the pilots' duties. This extremely effective CRM tool for developing situational awareness was unfortunately stopped with the restriction of access to the flight deck following the events of September 11. While I have had the benefit of this experience, our newer flight attendants have not had the opportunity to experience an observation ride in the flight deck.

While it may no longer be possible to conduct the observation flight deck rides for new hires, there are other things that can be done to begin reversing this adverse trend in communications training. Pilots and flight attendants have different cultures and often react to situations in very different ways, so good communication between the groups is vital.

In the U.S., flight attendant classroom training hours have been reduced to the bare minimum required by regulations. U.S. regulations require annual training on dealing with emergency situations, the use and function of emergency equipment onboard the aircraft, security and CRM, just to name a few of the subjects. Unfortunately, the trend has been to squeeze all this safety and security information into as little time in the classroom as possible.

Similar to some of the European carriers like Air New Zealand and Swiss Air International, some of the smaller U.S. carriers AFA-CWA represents provide 2 days of recurrent training. The U.S. carriers may only operate one aircraft type with the same

cabin configuration and emergency equipment. One has to wonder what subjects are being short-changed in the one-day recurrent training that the larger carriers are providing. Certain subjects like emergency equipment must be covered by regulations, so if you only have an 8-hour day for training, and multiple subjects to cover, some of those subjects, for example security training and CRM concepts, are routinely getting merged with other subjects. They may no longer be standalone subjects, which is legally permissible since subjects like CRM have no specific minimum required training hours. A common example is rolling CRM time management and communication skills into emergency response training. The guidance materials for CRM training say that time management must ensure that pilots or flight attendants can effectively "brief" other crewmembers and passengers in a limited time. This CRM concept is now incorporated into our emergency response training – we are trained to ask the pilots for information relative to the nature or type of emergency, the time we have to prepare the cabin, and if there are any special instructions for dealing with the emergency. The U.S. carriers can now "tick the box" that they have completed the regulatory requirement for CRM training.

While quantity of hours spent in training do not necessarily guarantee quality, the setting of a minimum number of hours for subjects like CRM training would help to prevent rolling the subject in with other training subjects. Effective CRM cannot be learned from a book or a lecture or a video or a supervisor. People can only learn to communicate effectively with each other by practicing the art of communicating with each other. And there is more to the CRM concept than just getting type, time and special instructions from the pilots.

Joint CRM Training

Both the U.S. regulations and the JAR Ops require training in CRM, but neither require mandatory training involving both pilots and flight attendants, even though safety often depends on precise and accurate communication between the two groups.

There are a handful of international airlines and a very limited number of US carriers providing joint pilot and flight attendant CRM training. However, the majority of airlines do not provide this training. The reasons often cited include difficulty in scheduling of the two types of crews and the economic costs involved.

Joint CRM training is an important and effective tool for improving crew coordination, and should therefore be implemented at all airlines as one means of ensuring maximum levels of safety throughout the aviation system. And while frequent, at least annual training is desirable, the reality is that biennial or even triennial training can be effective if done properly.

AREAS FOR IMPROVEMENT

Many of the above mentioned changes and improvements have helped increase the overall survivability in emergency situations. Many of them were long overdue and took many years to be implemented and in our opinion may not have gone far enough. But we recognize that in the end they are at least a small step forward to improving survivability. We would now like to focus on a number of areas where steps are still needed to increase the odds of survivability and reducing risks for serious injuries.

Training

Flight attendants in order to remain qualified must receive training at certain times during their career. Flight attendant training is composed of several required types of training. They are indoctrination, initial, transition, differences, emergency, recurrent and requalification training. These trainings combine to form the training program. The training program is approved by the FAA and can be changed upon approval by the FAA.

New hires will go through indoctrination, initial and emergency training. There are some time requirements associated with these new-hire types of training. For current flight attendants to remain qualified they must attend an annual recurrent training. The regulations specify this must be done every 12 months and again there are some hours

specified. Each carrier that operates commercial airplanes must have an FAA approved training program that covers all the subjects, hours and time intervals for their training.

All part 121 operators are following the same training regulations. Yet each carrier can have very different training programs, again, which must be approved by the FAA. While the regulations set forth the minimum number of programmed hours for certain trainings the regulations themselves also allow a reduction of these programmed hours. The carrier has the ability to ask their FAA inspector to approve their reduction in training hours. And after completing an approval process with the FAA these reduced hours now become part of the air carrier's training program.

The AFA-CWA over the years has expressed concern over the apparent extreme differences in the levels of training that our members receive. As an example all operators are required to provide recurrent training to each active flight attendant every 12 months. This training should ensure that each crewmember is adequately trained and currently proficient on each type of aircraft on which the flight attendant is to serve. The regulations stipulate that all required subjects and topics in initial and emergency training be covered in recurrent training. Recurrent training should include updated information on equipment, operational practices and procedures, information from accidents and incidents, and on areas that require special emphasis.

Some of the regional airline operators are providing a two-day recurrent training for their flight attendants. This is likely an operator that has one or two aircraft types, with similar configurations of the cabin, similar locations for emergency equipment and similar procedures for emergency evacuation. A major operator, in contrast, that has multiple aircraft types, in multiple aircraft configurations will conduct a one day recurrent training. Part of recurrent training is knowledge on the operating procedures of each door in the fleet in both the normal mode and emergency mode. So the more aircraft types a carrier operates the more aircraft door opening/closing procedures a flight attendant would need to know about. The door is just one example of how unrealistic it is that a major operator is able to get all the required subjects into a one-day recurrent training

while the smaller regional operator is finding it necessary to have a two-day recurrent training. One of these groups might be getting a better overall training.

Some have argued that this reduction to recurrent training is allowed because of the increased amount of material that is being presented in homestudy or computer-based training modules. This training can be as simple as filling in blanks in a notebook, watching a video or a similar activity. The FAA does allow homestudy to substitute for a percentage of the programmed training hours. While we recognize the potential that this type of "distance education" may hold for enhancing future training, we do not believe the industry is currently at a stage where this "fill in the blank" on a piece of paper or "hit the enter key to progress to the next video slide" is at a level that operators should be using it as a replacement for traditional classroom studies. Distance learning is also only relevant to knowledge and cognitive skill learning objectives. Creditability of distance learning is more complicated in regard to psychomotor skills and performance.

Distance education or computer-based training should not be a substitute for hands-on realistic training. In many industries you hear the saying, "practice makes perfect." Aviation is no different, especially when you are dealing with an emergency situation. Current training requirements for flight attendants stipulate that at one time during their career they must perform a PBE (protective breathing equipment) drill and a firefighting drill. This drill could include locating the source of the fire or smoke, coordinating and communicating to other crewmembers the situation, choosing the appropriate fire extinguisher and getting the PBE, donning the PBE, moving passengers away from the fire, fight the fire until it is extinguished and continue to update fellow crewmembers as appropriate. Realism is an extremely important part of dealing with emergency situations. Even though this is a one-time required drill the FAA does not require that it be conducted with an actual fire. The regulations allow use of a simulated fire or smoke.

At a recent safety conference that I attended, attendees were asked what their training requirements were, if any, for flight attendants conducting the fire extinguisher training and whether the training required an actual fire. The conference attendees represented

various countries with different regulatory training requirements. Needless to say the U.S. and Australia were the only two countries of the five in the room at the time that did not require a live fire fighting drill for their flight attendants. Both allowed the use of simulated fires. Japan and Jamaica conduct live fire drills yearly. Canada requires new hire flight attendants to combat a live fire and every 36 months thereafter. Each trainee is required to demonstrate the correct use of a fire extinguisher applied to an actual fire while wearing a PBE.

It is imperative that training for equipment and emergencies be done in an environment or setting relevant to the specific equipment conditions. A disadvantage to using a simulated fire is that the urgency and stress of the situation may not realized due to the lack of realism. This realism can also help the flight attendant to be more confident in her/his approach to an emergency situation.

AFA-CWA was a vocal advocate on improving the flight attendant training standards. The Cabin Safety Training Working Group, under the FAA Aviation Rulemaking Advisory Committee (ARAC) subcommittee on Air Carrier Training and Qualifications began meeting in the early 1990s to address possible changes to training standards. Although old documents show that some of the training issues discussed were radiation and its effects on cabin crew members, crew resource management (CRM), and fire training, the only issue that the working group could reach consensus on was the single regulatory issue that there should be an English language standard for flight attendants. An ANPRM was published in the Federal Register on April 18, 1994. In February of 1996 the FAA announced the formation of another ARAC to dispose of the 1994 ANPRM comments. Midstream of the ARAC process the FAA withdrew the ANPRM stating that any possible rulemaking on the subject would be incorporated into the overall context of a crew training rulemaking project that was then being developed internally at the FAA.

In 2004, this internal FAA rulemaking project was eventually shared with some of the industry through the creation of an Aviation Rulemaking Committee (ARC). The ARC

focused on changes to improve flight safety issues; the application of simulation to flight crewmember training, testing, or checking activities; and the implementation of technical changes in training and qualification standards. The AFA-CWA participated in this ARC.

The NPRM on Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers was published in the Federal Register on Monday, January 12, 2009. The document is quite lengthy at 175 pages. AFA-CWA has yet to review the document in its entirety but we are hopeful that it will address some of our past training concerns. On a review of the document a couple items did stand out. The proposed training regulations would require hands-on training on some emergency equipment every 12 months versus the current 24 months requirement for hands-on training. Flight attendant ground school instructors will now be required to receive specific training and qualifications as instructors. And of course, the English language requirement is included.

In summary, current flight attendant training can and must be improved. Hands-on training is crucial and these flight attendants from Flight 1549, a more senior crew, have had years of hands-on practice which we believe is crucial for the necessary skill sets. If the airlines can spend a great deal of time and money training flight attendants how to use credit card swiping devices, surely they can commit the time and resources necessary for vital, hands-on safety training. We are hopeful that working through the new NPRM on flight attendant training we can keep a focus on the need for hands-on, realistic training.

Fatigue

Fatigue experienced by front-line aviation workers is a long-standing concern of investigations into commercial aviation accidents and incidents. These concerns have led to significant research into fatigue experienced by flight deck crew, and, to a lesser extent, maintenance and air traffic control workers. No one questions that pilot and mechanic fatigue is a serious concern, but I am here to tell you that flight attendant fatigue is also a very real and serious concern that poses a potentially dangerous risk to aviation safety.

Multiple studies have shown that reaction time and performance diminishes with extreme fatigue – an unacceptable situation for safety and security sensitive employees. Flight attendants are required to be on board to assist in case an aircraft emergency evacuation is necessary. In addition, they are inflight first responders who are trained to handle smoke and fire incidents, and medical emergencies including CPR and emergency births. Furthermore, since the terrorist attacks of September 11, 2001 flight attendants have assumed increased responsibilities for protecting the safety and security of air travelers during flight. It has become even more important for flight attendants to be constantly vigilant of the situation in the aircraft cabin, notice and monitor unusual passenger behavior, and be aware of their surroundings at all times. Given these increased responsibilities, an inability to function due to fatigue could seriously jeopardize the health, safety and security of the traveling public and other crewmembers.

We have received reports from flight attendants admitting that due to fatigue they had forgotten to arm their evacuation slides, or due to fatigue had forgotten they had unaccompanied minors onboard and allowed them to leave the aircraft by themselves. There are examples of flight attendants falling asleep or nearly falling asleep on their jumpseats during landing. The same jumpseats that are located next to the emergency exit doors which would need to be used in the event of an emergency evacuation.

We also have examples from flight attendants that have said they are too fatigued to drive home, or operate their car, for fear of getting into an accident. We even have reports of members being stopped by law enforcement when driving due to the fact that police believed they were driving under the influence of alcohol because of their erratic driving. Just prior to that they would have, by the FAA's account, been okay to operate the emergency equipment onboard an aircraft in a fatigued fashion. However, as a fatigued driver on the road they are a hazard to others.

All these safety mishaps can have devastating ramifications. Fortunately they have not.

In the last few years the aviation industry has finally begun to study flight attendant fatigue. I want to review some recent and planned flight attendant fatigue studies, as well as some of the operational issues as they relate to flight attendant roles and responsibilities. I will start first with an internal study that my organization did in 2005 so that we could begin to further highlight the problem. But first you need to understand the U.S. regulations that govern the flight attendant's duty and rest requirements.

In the U.S., as in some other countries, the flight deck and flight attendants operate under two different duty time regulations. The flight attendants can be made to work longer hours and have a different working pattern. While some countries may afford the cabin crew the ability to not continue flying because of fatigue, this is not the case for all countries. In the U.S. we have some operators that allow pilots to be released from their scheduled duty due to fatigue, but a flight attendant is not afforded the same relief without a possible disciplinary action by the operator. Many of the same issues that contribute to pilot fatigue contribute to flight attendant fatigue. Like pilots the timing of work hours, time zone shifts, and any subsequent impact of off-duty sleep quality also contribute to flight attendant fatigue. Another similar area of concern is the length of a continuous wakeful period. However flight attendants are even more susceptible in this area because, unlike pilots, we do not have a regulatory hard limit on actual flying time in a 24 hour period.

The minimum rest requirement for pilots and flight attendants in the U.S. is also similar. According to the U.S. Federal Aviation Regulations (FARs), pilots and flight attendants flying under 14 CFR Part 121 must have a minimum rest period of at least nine hours following any scheduled duty period. Flight attendants can be scheduled up to 14 hours of duty. The nine-hour period can be reduced to as little as eight hours, if the employer schedules a 10-hour rest period following the next duty period. I'd like to make a further clarification at this point. Using the term "rest period" can be misleading because much more must be done during this period of time other than simply sleeping. The "rest period" can begin as soon as fifteen minutes after an aircraft pulls into the gate and continues until one hour prior to their next departure. This "rest period" must also

include travel through an airport, waiting time for a shuttle to the layover hotel, travel to the hotel, checking-in, possibly finding time to eat a meal since many of our carriers in an effort to cut costs have removed flight attendant crew meals from the flights, getting prepared for bed, getting dressed in the morning, getting breakfast and prepared for work the next morning, travel back to the airport and last, but certainly not least is sleep time.

As the deep concessions demanded of flight attendants during the recent and ongoing financial turmoil of the airline industry have taken hold it has become clear that airline management hopes to keep our members working longer duty days with greatly reduced time off between duty. The airline industry practice has been to schedule as little as nine hours of rest for flight attendants. They have also been using the reduced rest provision. It is our understanding that the reduced rest period provision was originally meant to accommodate "day of" scheduling when carriers encounter delays out of the carriers' control such as bad weather or air traffic control delays. The FAA has also discounted flight attendant fatigue. The FAA has chosen to ignore the routine implementation of this provision by airline management and the further erosion of meaningful rest periods for flight attendants. To further highlight the FAA's turning of a blind eye to this practice, an FAA spokesperson, in response to a question from the media on this issue stated, "The FAA rules on flight time and rest for both pilots and flight attendants are fundamentally sound. They serve aviation safety very well." We fundamentally disagree.

To investigate our concerns the AFA-CWA conducted a fatigue study in early August to early September 2005. Two of the objectives of the study were to characterize the flight attendant duty and rest periods and also catalog flight attendant perceptions of their work. Fifty members from 10 airlines participated in the survey. It was a month-long survey that recorded their activities on a daily trip log. We analyzed 58 trips which typically ran 3-4 days duration each. There are some assumptions relative to the data collected on the 58 trips. All trips begin and end at an airport. Each scheduled and actual duty day is a consecutive block of time with no gaps. Meal breaks at an airport or inflight do not subtract from the duty time. Another assumption was that the scheduled rest runs from the end of one duty day to the start of the next duty day.

The average trip length for the 58 trips evaluated was 52.7 hours. This resulted in scheduled duty time that was about 44 percent of scheduled total trip time which meant that scheduled rest was about 56 percent of scheduled total trip time. However, of the 56 percent of the trip that was scheduled rest time, only 52 percent resulted in actual reported sleep, with preparations before and after sleep, ground travel, eating and miscellaneous non-sleep activities consuming the other 48 percent. Thus, one could reasonably argue that an 8 hour scheduled rest period may result in a flight attendant getting only slightly more than 4 hours of actual sleep. If further evidence confirms this result, we contend that the regulatory policy governing safety sensitive employees that allows 8 hours scheduled rest periods is unacceptable.

Not only was AFA-CWA concerned with flight attendant fatigue but so was the U.S. Congress. The Omnibus Appropriations for FY '05 contained an appropriation for $200,000 directing the FAA to conduct a study of flight attendant fatigue. The FAA was to report back to Congress by June 1, 2005 with their findings.

The FAA delayed release of the report for over one year, even though the study itself was completed. The FAA repeatedly ignored requests from AFA-CWA and members of Congress to release the report and explain the delay in reviewing the study by the Administrator's office. Finally, after AFA-CWA staged an all night "sleep-in" by flight attendants in front of the FAA headquarters in order to draw attention to the issue, the FAA released the report.

In order to complete the required study, representatives of the FAA from the Civil Aerospace Medical Institute (CAMI) initiated an agreement with NASA Ames Research Center to perform an evaluation of the flight attendant fatigue issue. Due to the short internal deadline for conducting the report, the researchers were unable to conduct a thorough and comprehensive study of flight attendant fatigue. It primarily consisted of a review of existing literature on the issue, an evaluation of flight attendant duty schedules and a comparison of those schedules to the current regulations regarding rest. Based just

on this limited research, the report concluded that flight attendants are "experiencing fatigue and tiredness and as such, [it] is a salient issue warranting further evaluation." They also stated that "not all the information needed could be acquired to gain a complete understanding of the phenomenon/problem of flight attendant fatigue."

The report listed a number of recommendations for further study. They were:

1) A scientifically based, randomly selected **survey of flight attendants** as they work. Such a study would assess the frequency with which fatigue is experienced, the situations in which it appears, and the consequences that follow.
2) A **focused study of aviation incident reports** in order to determine what role fatigue played in already reported safety incidents.
3) The need for **field research on the effects of fatigue**. This research would explore the impact that rest schedules, circadian factors and sleep loss have on flight attendants' ability to perform their duties.
4) The determination and **validation of fatigue models** for assessing how fatigued a flight attendant will become. Developing a reliable fatigue modeling system would be an important tool for the aviation industry in helping to determine when rest periods should be scheduled.
5) A **study of International policies and practices** to see how other countries address these issues.
6) **Development of training material** to reduce the level of fatigue that may be experienced by flight crews and to avoid factors that may increase fatigue levels.

The second, more comprehensive study based on the recommendations from the 2005 study is now being conducted by the FAA. Two of the main components required to be conducted are; 1) the survey of field operations, and 2) the field study. The Survey of Field Operations is the larger of the two projects. The survey will solicit input from approximately 22,000 U.S. flight attendants. The survey looks at: general demographics; flight operations; sleeping at home; duty days (including scheduling practices); fatigue (including perceptions of fatigue, fatigue factors, and fatigue effects); and work

environment (including corporate attitudes, safety, training, and management quality). The collection of these surveys is currently ongoing and will end March 31, 2009.

The Field Study is a smaller sampling group. It will include approximately 200 flight attendants. They will be asked to report and monitor their duty periods, sleep and activities over the course of a single month of flying using personal digital assistants (PDAs), wrist activity monitors and pedometers. Data collection for the field study will begin prior to a trip, continue throughout the trip, and for a few days after returning home to assess recovery. The field study will begin in a couple months.

The issue of flight attendant fatigue is also more relevant now with the advent of aircraft being able to fly longer distances. Airlines are expanding their operations to include longer flight segments, some of which can have block times exceeding 16 hours. These Ultra Long Range (ULR) Operations require careful study to determine appropriate fatigue mitigation strategies for all crew members, including flight attendants.

We believe that the issues of operational requirements, training, crew staffing levels and duty cycles must be considered if flight attendants are to participate in ULR operations. The regulatory authorities must first establish firm regulatory rest requirements for ULR operations, with no allowance provided for discretionary reductions of these requirements by the operator or their personnel.

Recently the FAA began to address the issue of ULR operations and create standards that would help combat fatigue for both pilots and flight attendants. The FAA, recognizing that a flight of 16 hours in duration or longer was not addressed in the U.S. regulations, reached agreement with one operator on an operations specification that regulates many of the duty and rest concerns specific to their ULR operation. Around the same time, two other U.S. airlines began considering their own ULR operations. The FAA, to ensure a level playing field, began a process that led to a template operations specification for the industry. Initially the FAA presented the two U.S. airlines seeking to start ULR

operations with the proposed document. The FAA later allowed other aviation industry stakeholders the ability to review and comment on the document.

Although the FAA followed a relatively transparent process in developing the ULR operations specification, and in spite of the overwhelming evidence generated over the years regarding fatigue, the ULR operations specification has not been accepted by the majority of U.S. airlines that may conduct such operations. In fact, seven U.S. airline operators are now suing the Federal Aviation Administration for implementing the ULR operations specifications. The lawsuit states that the new ULR operations specification apply new regulatory requirements to operators that will impose substantial burdens and costs on operators. The lawsuit also contends that the ULR operations specification constitutes a rule of general applicability and under U.S. law a public notice and comment period was required, and that by not following the rulemaking process, stakeholders with expertise on the underlying safety issues were not given the opportunity to participate in the public comment process.

Nineteen U.S. airlines, through their trade and service organization the Air Transport Association of America, Inc. (ATA), filed comments opposing the current and ongoing FAA flight attendant fatigue survey of field operations and the field study that was referenced earlier in this paper. Their opposition to the fatigue research for flight attendants was based on three considerations: 1) the proposed survey will not add practical information to existing knowledge, 2) extensive information already exists on fatigue in aviation and 3) the Federal Register notice does not adequately describe the FAA proposal.

One of the items that was missing from the FAA ULR Operations Specifications template was a mandatory requirement for bunk facilities for flight attendants. As a flight attendant this was an unacceptable and unsafe option. An onboard crew bunk attempts to replicate an environment that is conducive to sleep, that is one that is comfortable, dark and quiet. Design of such environments should also consider the ventilation, temperature/humidity control as well as the necessary communication systems and

emergency equipment needs. Previous studies on pilot sleep in onboard bunks have been conducted. Past study conclusions have stated that in-flight sleep in a crew bunk is inferior to sleep an individual gets in their home environment or at their layover location. Other studies have concluded that rest in a bunk, even with its limitations, is superior to rest in a passenger seat in the cabin of the aircraft.

The U.S. National Transportation Safety Board (NTSB) itself has recognized the danger posed by fatigue in the transportation industry and has recommended setting working hour limits for transportation operators based on fatigue research, circadian rhythms, and sleep and rest requirements. In fact human fatigue has been on the NTSB's "Most Wanted" list since 1990. So this discussion is nothing new in that sense. The one problem with the NTSB recommendation is that it does not include the need to address flight attendant fatigue.

I believe that it is abundantly clear that flight attendant fatigue is real, it is a problem and that it is growing. Some may argue, and indeed have argued, that an error caused by flight attendant fatigue is not as serious as an error caused by pilot fatigue or maintenance fatigue because the flight attendant error does not cause the aircraft to crash. These same people would also claim that flight attendant fatigue does not warrant inclusion on the "most wanted" list. This argument is short sighted. An error caused due to flight attendant fatigue can lead to a tragic loss of life in the event of an inflight emergency or during an evacuation.

We know that there have been incidents over the years where flight attendant fatigue was an issue. For example, on July 9, 1995, an ATR72 operated by Simmons Airlines, as American Eagle Flight 4127, experienced the loss of the rear cabin entry door during the takeoff climb. The flight crew was able to circle around and land successfully. The aircraft received minor damage and one flight attendant received minor injuries. The flightdeck crew, the other flight attendant and the 61 passengers reported no injuries.

The probable cause of the incident was the flight attendant inadvertently opening the door inflight due in part to flight attendant fatigue from a lack of sleep and the long duty day. The flight attendant estimated that she had approximately 5 hours of sleep the night before the incident flight. Also, contributing to the incident was a change in the design of the door locking mechanism.

If we add the human factors issue of fatigue - impaired judgment - and then add the human factors design issue - the re-design of the door - we have a perfect human factor interaction error in the Simmons incident. Industry is continually working to build aircraft that alleviate the human factor design issue, so why would we say the human factor issue of fatigue in the cabin isn't a concern? We should work to address the fatigue factor just as well.

Take another example of an emergency. On August 2, 2005, an Air France Airbus A340-313 aircraft overran the end of the runway and came to a rest in a ravine just outside the perimeter of Toronto's Lester B. Pearson International Airport. The flight had 12 crew members and 297 passengers on board.

After the aircraft stopped, flight attendants observed a fire outside the aircraft and ordered an evacuation. The flight attendants facilitated a fast evacuation from the emergency exits while an intensifying fuel-fed fire was engulfing the aircraft. Only four of the eight emergency exits equipped with slides were usable for evacuation, due to one slide failure and fire around the vicinity of the other slides. Amazingly only two crew members and ten passengers were seriously injured. The aircraft fuselage was eventually consumed by fire.

If the flight attendants on Air France Flight 358 had been fatigued the outcome of this evacuation could have been very different. What if they had pulled the quick release handle on one of the remaining four useable slides instead of the inflation handle? If that had happened, the crew would have then been down to only three exits for the

evacuation. This could have very likely happened as we know that flight attendants make mistakes due to fatigue as we saw in the Simmons incident

Fortunately, flight attendant mistakes are often not as obvious because of the current extraordinarily low number of accidents. But the potential for a serious incident is there.

To ensure safety of the entire transportation industry as a whole we must look at all workers that could have an affect on the survival rate of passengers, not just the pilot who operates the aircraft or the maintenance personnel who fix broken equipment. We are, after all, operating the equipment that fights fires, provides medical first response, and helps with a safe and speedy evacuation. To say that flight attendant fatigue should not be a concern, or is not as important because we are not the sole factor that could cause an accident, or that we don't operate a moving vehicle, is to perpetuate an unspoken assumption that saving passenger lives doesn't matter.

Flight attendant fatigue must be addressed. I offer the following suggestions to help create a better understanding of flight attendant specific fatigue and some fatigue management strategies.

1) Flight attendant fatigue data needs to be collected from actual operating environments. While some international airlines have been conducting studies with their flight attendants the U.S. airlines have been inexcusably resistant to data collection of this type.
2) There needs to be a crew reporting mechanism with associated feedback. This reporting procedure must first allow a flight attendant to "call in fatigued" similar to a pilot without discipline (non-punitive approach to safety).
3) There must be a process for investigating fatigue reports or incidents and implementing corrections or new procedures that might solve or reduce the recurrence of the problem.

4) Management must support scheduling practices, operational practices, rest environments and attendance policies that support reducing fatigue in their operations.
5) Education and awareness training programs should be conducted for all employees (crewmembers, schedulers, dispatchers, etc.) having a responsibility for ensuring an airline operation that does not promote fatigue.
6) For ultra-long range operations on-board rest facilities should be required.

While there is a place for science to assist it should be in addition to and complement mandatory maximum duty and minimum rest requirements. As you have seen in my testimony, some airlines have been less than supportive of true fatigue mitigation strategies. It would be a shame if airlines could use science to inappropriately ensure their operational needs were totally satisfied to the detriment of fatigue management. It is therefore important to realize that while the industry appears to be heading to a less prescriptive approach to fatigue management there is still a place for traditional regulations that limit the number of hours worked versus the new thoughts of "comprehensive plans" that help identify fatigue and mitigate risks.

We can all agree that it is possible that a flight attendant error, due to fatigue, could possibly result in the death or serious injury to some of our passengers. Therefore, it is crucial that we be just as concerned with flight attendant fatigue as pilot and mechanic fatigue if we hope to achieve the aviation goal of preventing accidents and saving lives.

Fatigue is not an issue that can be mitigated through simple education. It must be addressed through regulations and adequate rest periods should not be subjected to the collective bargaining process.

Development of a Method for Assessing Evacuation Capability of Aircraft Under Actual Emergency Conditions

Design standards are used in the design phase of a project, and can be verified while the product, in this case, an airplane, "is still on the drawing board." i.e., before the airplane is built. Performance standards evaluate the performance of the product, often under the influence of factors that cannot be effectively integrated or evaluated during the design. Typically, a performance standard involves a test of the product after it is built. In the case of a full scale evacuation demonstration (a performance standard) of an airplane, the factors that must be evaluated are the performance of the passengers and crew.

The FAA made a change in policy that would allow new airplane designs or any increase in an existing design's capacity to be approved using analysis of data from past tests, rather than conducting a full scale test of the model requiring certification. But there is currently no analytical method that is capable of predicting failure of the crew and passengers to meet the performance standard after the design standard has been met. There have been such failures in the past. Since there are no analytical methods that can properly substitute for the full scale demonstration, the FAA cannot enforce their policy.

The requirement for full-scale emergency evacuation demonstrations was introduced by FAA NPRM 63-42 (28 FR 11507, October 23, 1963). This notice justified this proposal by stating: "Recently, the Agency observed several simulated passenger emergency evacuation demonstrations which were conducted by various air carriers using different types of airplanes. The time required to accomplish each of these demonstrations varied from 131 to 213 seconds using 178 to 189 persons. In all instances, it was evident that a more realistic assignment of functions within the cabin would have resulted in lesser time to evacuate the airplane satisfactorily. From these demonstrations, it has been concluded that a physical demonstration of an air carrier's ability to execute its established emergency evacuation procedures within a specific time period is necessary in the interest of safety and to insure a more realistic assignment of functions which, in turn, will result in satisfactory accomplishment of emergency evacuation procedures."

Clearly, the original intent of the evacuation demonstration was to show the satisfactory accomplishment of emergency evacuation *procedures*. The final rule reinforced this intent (30 FR 3200, March 9, 1965).

The following year, FAA Notice 66-26 (31 FR 10275, July 29, 1966) proposed to establish comparable requirements for the airplane manufacturers. This notice stated that "...traditionally, it has been considered sufficient to provide the necessary components for emergency evacuation through detailed quantitative requirements prescribed in the airworthiness rules. However, experience has shown that compliance with these requirements does not ensure that the airplane can be evacuated, during an emergency, within an acceptable time interval. Differences in the relationships between elements of the emergency evacuation system introduce a considerable variation in evacuation time, and this variation is expected to be even more marked on larger transport aircraft under development." Thus it was acknowledged that relationships between the various elements of the evacuation system, not just the elements themselves, had a critical influence on evacuation time. In other words, the whole was considerably more complicated than the sum of its parts. Since the manufacturer would be demonstrating the basic capability of a new airplane type without regard to crewmember training, operating procedures and similar items (such demonstration of procedures was still required under Part 121, the operational requirements), this new demonstration was not expected to validate the evacuation procedures of the air carriers or operators. FAA Notice 66-26 also proposed that once a manufacturer had successfully conducted an evacuation demonstration for a particular airplane type, the passenger seating capacity could be increased by no more than five percent if the manufacturer could substantiate, by analysis, that all the passengers could be evacuated within the prescribed time limit. This appears to be the first proposal to suggest the use of "analysis" in lieu of full-scale evacuation testing. However, this analysis was intended to provide comparison with the full scale evacuation actually conducted on the airplane. These proposals were adopted as a final rule (32 FR 13255, September 20, 1967).

The tests conducted by operators to show satisfactory accomplishment of emergency evacuation procedures and by manufacturers to show that the aircraft interior configuration and the relationship between the elements of its emergency evacuation system could be evacuated within a specified time period were allowed to be satisfied under a single test under Amendment 25-46 (43 FR 50578, October 30, 1978). Under this amendment, the FAA also stated that "A combination of analysis and tests may be used to show that the airplane is capable of being evacuated within 90 seconds under the conditions specified in 25.803(c) of this section if the Administrator finds that the combination of analysis and tests will provide data with respect to the emergency evacuation capability of the aircraft equivalent to that which would be obtained by actual demonstration." The FAA recognized the problems with this new provision and in its discussion of it concluded that: "Several commentators objected to the proposed amendment to 25.803(d) which would allow analysis in showing that the airplane is capable of being evacuated within 90 seconds. One commentator stated that analysis alone is an incomplete means of showing compliance and should not be allowed. Another commentator stated that extrapolations based on analytical testing have no practical relation to actual conditions which occur in accidents and evacuation demonstrations. The FAA agrees that the limitations on the use of analytical procedures should be made clear. The requirement that the Administrator find the analysis data acceptable was intended to *preclude approvals which might be based on insufficient test data, such as in the case of a completely new model or a model which has major changes or a considerably larger passenger capacity than a previously approved model"* (Italics ours.)

This intent was reinforced by the FAA Administrator in a 1986 Regulatory Interpretation and FAA Advisory Circular (AC) 25.803.1, Emergency Evacuation Demonstrations, issued November 13, 1989.

In 1985 testimony before the U.S. House of Representatives Subcommittee on Investigations and Oversight of this Committee (formerly named Public Works and Transportation Committee) and its Chairman, James Oberstar, the FAA Administrator

suggested that a reassessment of regulations pertaining to emergency evacuation of transport airplanes was warranted. Consequently, an Emergency Evacuation Task Force, open to the public, for that purpose was established in September, 1985. The continued use of full scale emergency evacuation demonstrations was one of the matters considered by that task force. One of the presentations, by Boeing, suggested that a rudimentary analytical procedure be used in lieu of full scale demonstrations. Basically, the manufacturers favored analysis, while the representatives of people who flew on the airplanes, either as crewmembers or passengers, opposed analysis. The task force was unable to reach consensus on when to accept analysis in lieu of a demonstration. A similar process was undertaken by an advisory committee to the FAA in the 1990s with the same failure to reach consensus.

The procedures used by the flight attendants in a full scale emergency evacuation certification demonstration are intended to become the baseline procedures for the aircraft type and model tested. This was the reason for the promulgation of the 1965 rule requiring operators to conduct full scale emergency evacuation demonstrations. These procedures are found in the Flight Standardization Board Report for each type and model of aircraft. Yet some demonstrations conducted since 1996 have utilized a procedure that makes it easier for the manufacturer to pass the test, but it is not a procedure that is used by U.S. scheduled operators. The intent of the regulation requiring full scale evacuation demonstrations is not being carried out by the FAA.

The analytical method does little more than calculate that, if the design standards are met, the aircraft could be evacuated within the requirements of the performance standard. Since the design requirements were intended to provide an airplane capable of being evacuated within the requirements of the performance standard, use of the analytical method is redundant.

Analysis is not a method that can predict failure of an emergency evacuation system, unlike a full scale demonstration utilizing appropriate evacuation procedures.

The result of the FAA's policy and of the currently inadequate "state of the art" analytical methods accepted under the policy, is that the first full scale evacuation of a new airplane will be performed by the traveling public under emergency conditions rather than by paid test subjects under the controlled test conditions of a demonstration. There is no assurance that the evacuation would be successful. For this reason, the FAA should be required to rescind its policy of allowing the use of analysis in lieu of the full scale demonstration until a scientifically valid method is developed.

The time is past due for development of a method for assessing the evacuation capability of aircraft under real emergency conditions. An independent blue ribbon panel needs to be established within the National Academy of Sciences (NAS) to examine these problems in depth and design a study to develop such a method, if not develop the method itself.

Contaminated Aircraft Air

The issue of poor aircraft cabin air quality and in many cases the contamination of the air supply by potentially toxic chemicals continues to pose a threat to those that work onboard the aircraft as well as those that travel onboard the aircraft. AFA-CWA believes that in some instances contaminated air could lead to a fatal incident or decrease survivability in some situations. At the heart of the failure of the US Federal Aviation Administration (FAA), the manufacturers, and the airlines to *resolve* problems with aircraft air quality is their failure to *acknowledge* problems with aircraft air quality. There are no standards for protective measures or access to information necessary to prove individuals' cases; there is effectively no government oversight, allowing the steady flow of "anecdotal" reports to be dismissed as unreliable, and therefore irrelevant.

It is no small task to describe and document problems with air quality on aircraft; hence, the length of this submission. The problems are varied, but the lack of oversight and protective measures is common to all and is in desperate need of remedy. Here, seven

problems with aircraft air quality are described in detail. The highlights are described here:

Inadequate ventilation: In buildings, owners must meet minimum ventilation standards intended to protect occupant health and comfort. On aircraft, there is no ventilation standard, despite the fact that aircraft are the most densely occupied of any environment. In buildings, workers can request an OSHA investigation of indoor air quality. On aircraft, there is no government body assigned to investigate related illness reports. Further, there are no protections in place for flight attendants assigned to fly to areas affected by Severe Acute Respiratory Syndrome (SARS), even though crewmembers do not have the option of "postponing non-essential travel." The World Health Organization recognizes flight attendants as potential "close contacts"; the Centers for Disease Control and Prevention does not.

Polluted air supply on the ground. Exhaust fumes and heated deicing fluids can be ingested into the air supply systems, especially during ground operations.

Exposure to heated oils and hydraulic fluids. Heated oils and hydraulic fluids can leak or spill into the air supply systems during any phase of flight, potentially exposing passengers and crew to carbon monoxide and neurotoxins, such as tricresylphosphates. There are almost no protective measures in place to prevent air supply contamination, and contaminated aircraft can be – and are - dispatched as "airworthy." Chronic or even permanent neurological damage can result, although affected passengers and crew have little recourse without any record of air monitoring or access to maintenance records. Pilot incapacitation is an additional risk. The FAA has shown no signs that it plans to follow the recent National Research Council committee recommendation for requisite carbon monoxide monitoring on all flights.

Reduced oxygen in the ambient air during flight. During flight, the aircraft cabin is maintained at a reduced pressure, generally equivalent to an altitude of 6,000 –

8,000 feet, although sometimes higher. At an effective altitude of 8,000 feet, the supply of oxygen is reduced by 25% relative to sea level. There is evidence that the current "8000 feet standard", first issued in 1957, is based not on health, but on operating costs, and that the reduced oxygen supply may be inappropriately low for a substantial portion of the flying public.

Inadequate attention to the thermal environment. Providing air nozzles ("gaspers") at each occupant seat and work area allows flight attendants and passengers to adjust the temperature of their environment. This is especially important in areas where flight attendants are physically active. In addition, flight attendants regularly report that the galleys and jumpseats located near the aircraft doors can be uncomfortably cold at ankle level, presumably because the doors are poorly insulated. A standard that defines a target temperature range and maximum vertical and horizontal temperature differentials would address this problem. Door heaters have already proven an effective and practical remedy.

Exposure to ozone gas: Symptoms associated with ozone exposure are well documented and include respiratory distress and increased susceptibility to infection. Ozone levels increase with altitude and latitude, and are highest in the late winter and early spring. The exposure limit for ozone cited in the Federal Aviation Regulations is 2.5 times higher than the workplace limit set by the National Institute for Occupational Safety & Health. Airlines are under no obligation to monitor or record ozone levels in the cabin.

Exposure to potentially high concentrations of pesticides: Some countries require that incoming aircraft are sprayed with pesticides to kill any insects that may be on board and may carry disease. The pesticides are applied in occupied or soon-to-be-occupied aircraft cabin without any measures to inform or protect the health of passengers or crew. Reported symptoms range from sinus problems and rash to anaphylactic shock and nerve damage. Differences in exposure levels and individual susceptibilities are described. The

US Department of Transportation's investigation into the feasibility and efficacy of non-chemical methods to keep aircraft cabins insect free must be actively supported.

It is imperative that the members of this Committee keep the FAA focused on addressing this serious issue and supporting vital research that will help clarify and solve this ongoing problem. It is also important that the Committee assist in preventing airline management from stonewalling efforts to conduct vital studies of and efforts to address aircraft cabin air quality.

Cost Benefit Analysis

Finally, I'd like to discuss concerns with Cost-Benefit Analysis. An October 2001 report entitled High Hopes and Low Standards! The Life and Times of Airline Travel in Canada, by Andrew Reddick of the Public Interest Advocacy Centre, considered some of the issues related to use of the cost-benefit approach for regulating aviation safety. The following comments, borrowed from Mr. Reddick's report, offer a useful, thought-provoking perspective on Cost-Benefit Analysis:

> "Part of the problem in dealing with the safety issue and airline travel is the conceptual framework that the industry and to a degree, government, has adopted for safety. ... [T]hese differences are exemplified in how safety is dealt [with] through the choices in the industry between the 'precautionary principle' or the 'risk approach' (also referred to as risk analysis or cost benefit analysis).
>
> "In a precautionary approach, standards are created, and investments and initiatives are undertaken to prevent, or greatly reduce the potential for, a possible occurrence, and to provide resources to appropriately deal with an occurrence. In a risk approach, it is calculated that the likelihood of an event occurring is minimal or a low probability. As such, it is then considered more financially effective and efficient to not pursue certain undertakings. In this

framework, when an incident does occur, the cost will still be less than that of the proactive precautionary approach, up to a certain level. For example, through actuarial calculation, for some airlines it is less expensive to pay out claims in the case of injury or death to a certain financial level than to carry insurance or make equipment upgrades. This is of little solace to those passengers falling into the wrong statistical grouping when the 'risk' approach is used. As noted by Lyn Romano, head of the International Air Safety Association, the cost benefit analysis taken by airlines and regulators means it is 'cheaper to pay out big settlements than prevent an aviation disaster in the first place...This is a reactive, Tombstone Mentality approach, rather than a proactive approach...Too many of the safety issues have been known for years, but swept under the carpets.'

Beyond the obvious ethical questions about the value of life as opposed to money and equipment, from a strict methodological view point, this approach raises serious questions about whether a broad enough set of criteria are used to undertake cost-benefit-risk analyses which truly reflect the concerns, interests and circumstances of all parties, e.g., airlines, airports, passengers and their families."

AFA believes that the recent accident in Buffalo highlights the differences in perspective between the NTSB, which appears to favor the precautionary principle, and the FAA, which appears to favor cost-benefit analysis. This tragic accident gives the aviation industry an opportunity to revisit these differing approaches to regulating safety, and hopefully helps bring us back toward the precautionary principle, and away from cost-benefit.

In conclusion, we have been fortunate to see an overall decrease in commercial airline accident rates over the last few years. As I testified, improvements have been made. Many of those design improvements were required because of fatal accidents and developed almost two decades ago. As we've seen with the crew of Flight 1549, survival has become the norm, more so than the recent tragic accident in Buffalo. But we can not

rest on our laurels. We cannot stop researching new design standards that could further improve the accident survival rate. In addition, we must continue to evaluate and improve current operational procedures that would further enhance the ability of all crewmembers to fulfill their duties as safety professionals. AFA-CWA will continue to remain at the forefront of advocating for the safest aviation system in the world.

Prepared Testimony of
John E. Ostrom

CHAIRMAN, BIRD STRIKE COMMITTEE – USA

Before the Subcommittee on Aviation
Committee on Transportation and Infrastructure
U.S. House of Representatives
February 24, 2009

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Prepared Statement of

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BIRD STRIKE COMMITTEE – USA

Before
The Subcommittee on Aviation
Committee on Transportation and Infrastructure
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Washington, D.C.

February 24, 2009

Chairman Costello, Ranking Member Petri and members of the House Transportation and Infrastructure Subcommittee on Aviation, thank you for inviting me to participate in this hearing. My name is John Ostrom and I am Manager of Airside Operations for Minneapolis-St. Paul International Airport.

I am also proud to serve as the Chairman of Bird Strike Committee USA, and am testifying today on behalf of this organization. Bird Strike Committee USA was established in 1991 as an independent, non-profit organization dedicated to providing leadership to the aviation wildlife hazard management community. Our focus is on the exchange of information, training, and education, and the promotion of research and development to reduce the threat of wildlife hazards to aircraft operations.

Bird Strike Committee USA is directed by a Steering Committee comprised of representatives from the Department of Defense, the Federal Aviation Administration, the United States Department of Agriculture's Wildlife Services, the aviation industry and U.S. airports.

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* Manager, Airside Operations, Minneapolis-St. Paul (MN) International Airport

From the dawn of aviation to the present day, wildlife has posed a significant threat to aircraft and to the passengers they carry. However, the threat has significantly increased in recent years as a result of highly successful environmental programs during the past 40 years that have resulted in dramatic increases in populations of many bird species in North America that are hazardous to aircraft. For example, 24 of the 36 largest (>4 lb) bird species in North America have shown significant population increases in the past 30 years and only 3 species have shown declines. The non-migratory population of Canada geese (8-12 lbs) has quadrupled from 1.0 million to 3.9 million birds in the USA, 1990-2008. Over the past eighteen years, our organization and its members have worked diligently to bring awareness of this increasing problem to the forefront of the aviation industry. We have made significant progress but have much still to do to realize our vision fully.

On August 22, 2007, then Chairman of Bird Strike Committee USA Dr. Richard Dolbeer sent a letter to Vice Chairman Robert Sumwalt of the National Transportation Safety Board. In it Dr. Dolbeer expressed grave concerns regarding continuing hazards to aviation from conflicts with wildlife, especially birds. We asked for a further review of National Transportation Safety Recommendations A-99-86 through -94 (19 Nov 1999). In the letter, we identified five significant strike events that occurred between September 2005 and June 2007 that were at least as serious as those encounters which triggered the Board's Recommendations in 1999.

We also acknowledged the work done by the Federal Aviation Administration to improve wildlife control at airports by the then recent update of Title 14 Code of Federal Regulations Part 139, which included increased guidance on how airport operators must mitigate wildlife hazards.

Some of our specific concerns then and now are that there has never been a joint industry/government body established to address or even define the issue. There is no recognized metric or standard to judge whether conditions are improving or worsening, and there is no comprehensive industry/government plan to address the hazard to aircraft and human life.

In 2008, Bird Strike Committee USA reorganized to better address the changing needs of the aviation safety and wildlife management industries. As part of that effort, we identified the following seven goals:

1. Establish and facilitate additional forums for exchanging knowledge and information regarding the nature and management of wildlife hazards to aviation and best practices and innovative technologies in the aviation and wildlife management industries. Currently, Bird Strike Committees USA and Canada sponsor a joint annual meeting which is attended by both aviation and wildlife management professionals. Aviation and wildlife conflicts are a global problem, and we are working with our international partners, the International Bird Strike Committee (IBSC), on the possibility of future collaborative initiatives. In addition to our annual meetings and working with IBSC, we want to organize regional aviation wildlife hazard workshops for airports and flying communities around the country. The purpose of these workshops will be to establish a

grass roots education and awareness initiative on the hazards of wildlife to aviation and measures that can be taken to mitigate them.

2. Serve as the liaison to national and international Bird Strike Committees and to other professional aviation and wildlife organizations. In this capacity we will provide timely and informed advice on aviation wildlife hazard management issues to governmental agencies, decision makers and others who are responsible for the nation's air transportation system.

   Bird Strike Committee USA is working with the Federal Aviation Administration to establish a formal relationship which identifies Bird Strike Committee USA as the national committee for aviation wildlife hazard issues in the context of the International Civil Aviation Organization (ICAO) Airport Services Manual, Part 3 - Bird Control and Reduction. That document states:

   > "2.1 When a wildlife hazard problem is known to exist at airports within a State, Annex 14, Volume I requires that a national committee be formed. Such committees have proven to be popular venues to gain and exchange information on research and developments in airport wildlife control. Although the composition of a national committee may vary from State to State, it should include all of the stakeholders associated with or interested in the problem. It should be noted that national committees have very little authority in decision-making and usually act as an information source for those in the aviation community.

2.2 A national committee should include governmental departments such as transport defense, agriculture and environment as well as representatives from the major aircraft operators and airports, pilot's associations and airframe and engine manufacturers."

3. Conduct and promote communications efforts to enhance the awareness of wildlife hazards to aviation and efforts to reduce that threat.

   It is our intention to ensure that everyone involved in or affected by aviation-wildlife conflicts are fully cognizant of the issues as well as the tools and procedures needed to mitigate threats. Working with governmental agencies and aviation industry organizations, we intend to develop an informational awareness campaign and communications plan for the aviation community through the use of promotional materials and aviation industry media outlets.

4. Contribute to the public's understanding of wildlife hazard management and its significance to the safety of air travel.

   In the wake of the recent US Airways 1549 accident, it is even more critical that a safety and awareness campaign targeted to the general public be developed describing the positive work being done with the current airport wildlife management programs and their impact on safety of flight.

5. Promote professionalism in wildlife management programs on airports through professional development of individuals working in aviation wildlife hazard management.

   Managing our nation's wildlife resources at airports can be controversial, and it is our intent that persons performing this work be fully trained and knowledgeable of the tools available and of best practices. Bird Strike Committee USA is working to develop formal partnerships with industry organizations, academia and the private sector to create future training programs and ethical guidelines for personnel conducting wildlife hazard management activities on airports.

6. Promote the collection and analysis of accurate wildlife strike data for military and civil aviation in the USA as a foundation for a) understanding the nature of strike hazards, b) developing effective and appropriate management programs and c) evaluating the efficacy of management programs.

   According to the Federal Aviation Administration, there were 82,057 strikes recorded in the FAA's National Wildlife Strike Database from 1990 through 1997. Analysis of strikes from U.S. airports and airlines indicated that less than twenty percent of all strikes were reported to the FAA. Bird Strike Committee USA supports more aggressive reporting of all wildlife strikes, up to and including making strike reporting mandatory. In addition to increased strike reporting, it is imperative that we develop some form of performance measurement indicators that clearly identify progress towards specific goals in reducing wildlife hazards to aviation. As a previous Steering Committee Member once said, "We can't achieve success if we don't know where we are going." Finally, we need

to make all of the information in the FAA's National Wildlife Strike Database available to airports and industry professionals in order to foster increased collaboration amongst groups with similar problems to develop more effective management programs.

7. Anticipate future wildlife challenges to aviation and provide leadership in promoting education, research and development of effective methods for reducing wildlife hazards to aviation.

   Today, there is no single "clearinghouse" where yesterday's problems and tomorrow's solutions for aviation/wildlife conflicts can be brought together. It is our goal that Bird Strike Committee USA provide the future forum for scientific discussions as well as operational testing and standards for measuring performance of tools and processes for an effective and comprehensive aviation wildlife management program.

In conclusion, significantly reducing the aircraft/wildlife threat will require a collaborative effort by all aviation stakeholders with a major investment in education and research and development.

Chairman Costello, Ranking Member Petri and members of the House Transportation and Infrastructure Subcommittee on Aviation, I would like to thank you again for allowing me the opportunity to testify about the work being done by the volunteers of Bird Strike Committee USA to reduce the hazards to aviation posed by wildlife. We welcome the opportunity to continue working with you to ensure that our skies remain safe. Thank you.

STATEMENT OF

CAPTAIN JOHN PRATER

PRESIDENT

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

WASHINGTON, DC
February 24, 2009

US Airways Flight 1549 Accident

Air Line Pilots Association, International
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STATEMENT OF
CAPTAIN JOHN PRATER
PRESIDENT
AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE
SUBCOMMITTEE ON AVIATION
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
UNITED STATES HOUSE OF REPRESENTATIVES
ON
US AIRWAYS FLIGHT 1549 ACCIDENT

February 24, 2009

Good afternoon, Mr. Chairman and members of the Subcommittee. I am Captain John Prater, President of the Air Line Pilots Association, International (ALPA). ALPA represents more than 52,250 pilots who fly for 35 passenger and all-cargo airlines in the United States and Canada.

We had every expectation of testifying before you today solely to laud the captain and crew of US Airways flight 1549 and discuss ways in which we can help prevent the need for future such heroics. Most regrettably, we must also include in our remarks our most heartfelt and sincere sympathies and condolences to the families and friends of all 49 passengers and crew lost last week aboard Continental Connection (Colgan Airways) Flight 3407 and one individual who perished in his home outside of Buffalo, NY. The aviation industry has had a long run of very safe operations – with no airline fatalities in calendar years 2007 or 2008 – but this accident serves as a reminder that we can never afford to divert our attention or take safety for granted. Safety of flight has been and always will be ALPA's goal, but it is not one that can ever be fully realized.

Ironically, the pilots of Colgan Airways, whose members flew the ill-fated Flight 3407 as a Continental Airlines code-share operation, very recently joined ALPA. It has been our privilege and duty to assist our newest pilot group by providing accident investigation experts, financial resources, critical incident support, and help in many other ways since last Thursday night when their plane went down. We could certainly wish that this pilot group did not need these services, but we are most pleased that ALPA has been able to provide them with over 30 ALPA pilots from other airlines and staff experts to assist them in their hour of need.

The facts surrounding Flight 3407 are still being developed and the accident is currently under investigation by the NTSB, so it would be wholly inappropriate to speculate on what may have gone wrong. We do note, however, possible similarities with previous accidents. Recent media reports and a review of NTSB reports bring to mind events such as the crash of a Jetstream 4101 in Columbus, Ohio in January 1994, an ATR 72 which crashed in Roselawn, Indiana in 1994, an Embraer 120 which crashed in Monroe,

Michigan in 1997, a Canadair CRJ which crashed at Jefferson City, Missouri in 2004, and others which may ultimately be shown to have common factors. We applaud and support the NTSB's ongoing investigation into the accident in Buffalo, and stand ready to assist in identifying and, more importantly, work with Congress, FAA, the NTSB and industry in correcting deficiencies to further improve the safety and reliability of airline operations.

I am not certain that I or anyone else can say anything to applaud or honor Capt. Chesley "Sully" Sullenberger III, First Officer Jeffrey Skiles, and flight attendants Sheila Dail, Doreen Welsh, and Donna Dent, that has not already been said. I must also recognize the fact that there were two off-duty pilots from different airlines in the cabin who immediately became first responders and assisted the working crew to evacuate and care for the passengers. This crew is, for very good reason, the most famous airline crew today, and they have been rightfully feted from coast to coast at events ranging from the Super Bowl to the Presidential Inauguration. The perspective that I can provide that most others cannot, however, is that the flight crews' peers – airline pilots the world over – recognize the special talent and skills that they brought to bear on the afternoon of January 15th. The crew had mere seconds to make an operational decision that would forever impact their lives and the lives of all other passengers and crew – whether for good or bad – and they made the fateful and correct decision with a cool and calm that even Hollywood would be hard pressed to imitate.

Capt. Sullenberger's professional life has been focused on improving aviation safety. For him, flying is not just a job that he goes to several days a week; his mission for many years has been to enhance aviation safety for all and his time and energies outside of the cockpit have been used to do that very thing. Please pardon our lack of humility, but we could not be any prouder that for more than 20 years, Sully worked to advance safety for his ALPA local pilot council and master executive council knowing that by sharing his knowledge and experience all passengers and pilots would gain.

The Next Generation of Airline Pilots

The passengers and other crewmembers aboard Flight 1549 were most fortunate to have as their captain a man who has devoted himself to a lifetime of learning and experience in aviation and aviation safety. Capt. Sullenberger is not only a safety expert who teaches others, he is also a glider pilot and a former fighter pilot. His ability to "dead stick" his aircraft into the Hudson River, and his excellent performance under pressure, serve as testimonies to the experience that he has accumulated over many years and many thousands of flying hours in different kinds of airplanes.

Perhaps more than any other event in many years, the world was reminded last month of the value of having dedicated, highly trained and experienced aviators on the flight decks of our airliners. Although sophisticated technologies contribute to the safety of the aviation domain every day, they can never replace the value of human judgment and action when an emergency arises. It is not hard to imagine what the outcome would have been had this aircraft been flown remotely by a pilot on the ground – think Unmanned

Aerial Systems – who was unable to see and assess all available options and act accordingly.

What troubles us is that the piloting profession has eroded to the point where legitimate questions can be raised about whether the industry is capable of hiring and retaining the next Capt. Sullenberger. The profession has historically attracted the best and brightest aviators through a combination of wages, health and retirement benefits, work schedules and other compensation. Those days are, for now, on life support as airline bankruptcies, terminated pensions and extreme pressures to lower pilot wages have all but destroyed our cherished profession for current pilots and have plainly sent the signal to other qualified aviators to look elsewhere for the means to provide for their families. Capt. Sullenberger and his pilot colleagues at many airlines across the country have lost all or part of their retirement benefits, their other benefits and wages have been slashed, and they are flying longer schedules than ever before.

What the traveling public must understand is that cheap airfares come with a hidden "fee," and that fee is the damage that has been done to the ability of the airlines to offer an attractive career to the next generation of pilots, and its resultant safety implications. Many airline pilots today would not recommend that their children follow in their footsteps because of the poor working conditions already mentioned and the instability of the industry. It should be clear to even the most casual observer after seeing the outcome of Flight 1549, that airline safety depends on many variables, but the most important of all is to have highly qualified, trained and experienced pilots in the front seats.

I testified before this subcommittee in June 2007 on several issues including pilot training and new hire qualifications and would offer that statement again for your consideration. Because the airline industry is now contracting, the debate over new hire qualifications has subsided somewhat, but it will resume once the economy improves.

Mitigating the Risk of Bird and Wildlife Strikes

I would like to now discuss some of the serious issues that Flight 1549 raised and inform you of the airline pilot's perspective on them. Again, I would emphasize that these are issues brought to mind by our review of publicly available data from an ongoing NTSB investigation.

Aircraft Certification

The accident of Flight 1549 has been attributed thus far to a dual-engine failure which resulted when the aircraft struck a flock of geese while climbing through New York City airspace. The resulting collision with the birds reportedly caused a reduction and/or loss of power in both engines.

The potential for bird strikes is a well-known risk that is far from new; the Wright brothers recorded the first bird strike in 1905. The first bird strike-related fatality occurred in 1912 when aviation pioneer Cal Rodgers collided with a gull which became

jammed in his aircraft's controls and caused it to crash. Striking large birds at high speeds may result in catastrophic damage to an engine or an airframe. It is something that every pilot is aware of, concerned about, and generally powerless to avoid. Instead, we focus on reducing the probability of a strike and the severity of the consequences when a strike occurs. Airframe and engine manufacturers have made great strides in designing aircraft structures – including windshields and engines – that are able to withstand the enormous impact forces that result from encounters with most birds and remain capable of continued safe flight and landing.

Aircraft in scheduled airline service have multiple engines as a safety feature to provide a redundant power plant in the event that one engine fails completely. Engine bird-ingestion standards do not necessarily require that a modern jet engine be able to suffer a bird strike and continue to run with no performance degradation. Rather, the engine must be capable of safely shutting down and not failing so catastrophically that it causes damage to the surrounding parts of the airplane or cabin. Pilots are trained accordingly – to be able to shut down a damaged engine and continue to a safe landing. The rationale for this rule is that an event in which all engines on the aircraft are damaged to the point of producing no useable thrust is considered to be so rare that the design of the airplane and engines does not have to prevent it. Therefore, the need to understand the bird population in terms of size and numbers of different species is critical in ensuring that aircraft, windscreen and engine designs account for those events that are increasingly more probable.

ALPA was instrumental in the most recent efforts to improve the standards for engine bird ingestion. That effort was based on a 1976 National Transportation Safety Board (NTSB) Safety Recommendation[1] that called on the FAA to revise the FARs "to increase the maximum number of birds in the various size categories required to be ingested into turbine engines with large inlets." FAA agreed that the engine certification regulations should be modified to expand the bird ingestion testing requirements for large, high-bypass ratio engines and began to improve the standards.

While these rulemaking efforts represent progress in engine certification, the data used to develop the current standard is now over 10 years old. During the intervening years, aggressive conservation programs have resulted in greater numbers of larger birds. Continued avian research to determine today's bird strike risk is needed to improve engine certification standards.

[1] ON MARCH 11, 1976, THE NATIONAL TRANSPORTATION SAFETY BOARD COMPLETED ITS PUBLIC HEARING INTO THE OVERSEAS NATIONAL AIRWAYS, INC., ACCIDENT OF NOVEMBER 12, 1975. DURING THAT ACCIDENT, THE CREW OF A MCDONNELL DOUGLAS DC-10-30F REJECTED TAKEOFF FROM JOHN F. KENNEDY INTERNATIONAL AIRPORT AFTER A NUMBER OF LARGE BIRDS WERE INGESTED INTO THE NO. 3 ENGINE. ONE OF THE BASIC ISSUES IN THE ACCIDENT WAS THE CATASTROPHIC DISINTEGRATION OF THE ENGINE. Information obtained from NTSB Safety Recommendation Database

Ditching Considerations

The FAA requirements for designing airline aircraft are stringent, based on many years of manufacturing and operational experience, and are focused on providing the safest possible environment for occupants. Compliance with those standards makes it highly unlikely that serious problems will arise, but even the best-designed, best-operated aircraft cannot be made totally immune from danger. Thus, occupant survival provisions have been developed over the years which deal with everything from the flammability of fabric used for seat covers, to on-board medical care, to the possibility, however remote, of a ditching.

Fortunately, because ditchings are such rare events, there is very little actual operational data we can examine to validate applicable design standards. The performance of the airplane structure during a ditching obviously cannot be tested during manufacturing flight test; it is done almost exclusively by analysis. The aviation community has been afforded an extraordinarily rare opportunity, therefore – the chance to analyze a virtually intact commercial airliner that not only successfully landed on water, but also retained enough structural integrity to give all the occupants time to evacuate safely. We must, therefore, learn everything we can from this event, and the NTSB's investigation will lead the way to that knowledge.

We will not soon forget the dramatic footage of the survivors of Flight 1549 standing on the wings of the aircraft in life jackets and scrambling to reach life rafts. That scene highlighted two valuable safety features of airliners that may bear further investigation. The requirement for life jackets and other water-survival provisions is generally for those flights traveling some distance away from land. Indeed, some aircraft are designated as the "overwater" version of a common type to denote the fact that they are outfitted with those water survival provisions. However, some airlines are removing that equipment from those aircraft that do not fly extended distances from shore. ALPA suggests that it would be prudent for the FAA to revisit that practice and to undertake a detailed risk analysis to consider the possibility of a water landing in bodies of water other than the ocean, such as rivers and lakes.

Additionally, it appears that the emergency exits in the rear of Flight 1549 could not be used because that portion of the aircraft was partially submerged shortly after landing. The escape slides, which are required to be portable in order to be used at other exits, were therefore, unusable. It will be important as the investigation proceeds to determine why the aircraft floated in a tail-down position and what might be done to maximize the possibility that slide-rafts in all areas of the aircraft remain useable after ditching.

The passengers and crew of Flight 1549 were most fortunate in that the aircraft landed very near ferry boats which enabled an almost-immediate rescue from the frigid waters of the Hudson. If the same successful ditching had occurred a few miles away requiring passengers to board rafts and await rescue, it seems doubtful that sufficient raft space would have been available, and thus the outcome would not have been nearly so successful. ALPA urges the FAA, working with the NTSB investigation, to conduct a

thorough analysis of the requirements for, and capabilities of, the various water survival provisions on aircraft used in commercial service.

Pilot Training on Wildlife Avoidance

It is astonishing, but true, that bird and other wildlife strikes annually cause in excess of $1.2 billion damage to civilian aircraft around the world. In the United States alone, the FAA estimates some $600 million annually in damage and associated costs due to bird and wildlife strikes. Although bird strikes that result in commercial aviation fatalities are rare, this risk has brought down several aircraft and has seriously damaged many more. In 1995, a four-engined Air Force AWACS airplane crashed on takeoff from Anchorage, Alaska due to bird strikes and killed all 24 airmen onboard. In 2006, an airline B-767 on takeoff at Rome, Italy nearly lost all engine power due to bird ingestion but was able to land safely; the flight crew's flying skills were recognized as they became recipients of ALPA's Superior Airmanship Award.

Most reported bird strikes to civil aircraft in the U.S. occur in the airport environment at low altitudes: [2]

- 92% of all strikes occur below 3,000' AGL
- 42% of reported strikes to civil aircraft in the U.S. occur on the ground during takeoff or landing
- 73% of strikes occur at less than 500 feet above ground level (AGL).
- 2,014 strikes occurred above 5,000 feet AGL between 1990 and 2007.
- The U.S. record height for a civil aircraft strike is 32,500 feet.

These statistics inform us that even the very best airport wildlife hazard management plan is incapable of protecting aircraft once it leaves an airport's environs. In the case of Flight 1549, the collision with the birds occurred 2 to 3 miles from the airport.

Both the probability and severity of bird strikes is increased for transport aircraft compared to smaller, slower aircraft due to a number of factors:[3]

- Operating speeds are higher, reducing the time available to observe wildlife activity and increasing potential impact force and damage should a bird strike occur.
- The aircraft are larger and less maneuverable, making evasive action difficult.
- Large aircraft provide a greater opportunity for multiple bird strikes while flying through a flock of birds. Cockpit location can restrict visibility which limits the ability to see birds and mammals.
- The extreme workload during critical flight phases means the flight crew has limited time in which to observe wildlife activity.

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[2] Source: *Wildlife Strikes to Civil Aircraft in the United States, 1990-2007* (Federal Aviation Administration and Department of Agriculture, June 2008)

[3] Source: *Sharing the Skies - An Aviation Industry Guide to the Management of Wildlife Hazards* (Transport Canada, 2nd edition, March 2004).

- Use of alternate runways to avoid bird concentrations at busy airports can lead to significant delays. Commercial aircraft operating from busy airports are subject to tight schedule constraints; arrival and departure flexibility is limited when attempting to avoid wildlife activity.
- In the takeoff phase, commercial aircraft are frequently governed by published departure procedures and noise and traffic-management requirements which limit the ability to adopt alternate flight paths to avoid areas of bird activity.
- In the approach and landing phase, constraints are similar to those for takeoff and climb. Flight profiles are governed by published approach procedures. At large airports, sequencing high volumes of traffic further restricts flight path flexibility.

If birds are known to be in the vicinity of an airport, pilots can take precautionary actions, particularly prior to takeoff, but once airborne, knowing the hazard exists does not guarantee it is possible to maneuver to avoid it. Birds can be very difficult to see and their movements are unpredictable. Some courses of action available to pilots include:

- delaying takeoff or landing until the birds or animals are safely dispersed or known to no longer represent a threat,
- notifying ATC so other pilots can be alerted to the hazard, and
- reducing air speed in areas with high wildlife activity to minimize damage in the event of a collision.

While the airport operator is responsible for taking action to reduce the potential for bird and wildlife strikes on its facilities, the pilot in command is ultimately responsible for taking every reasonable precaution to operate safely. Some airlines provide a checklist that covers what to do following a bird strike but ALPA is unaware of any airline that provides wildlife avoidance training. Accordingly, we would suggest that wildlife avoidance techniques and guidance, such as that included in the Aeronautical Information Manual (AIM), be provided in airline flight operations manuals, training materials, and other company guidance for flight crew.

As part of ALPA's safety effort, I am very pleased to announce today that we have a new publication on the topic of wildlife avoidance techniques for pilots. It makes a number of recommendations which are germane to airlines, airport authorities and flight crews. The document, entitled "Wildlife Hazard Mitigation Strategies for Pilots" is available on our website at www.alpa.org.

Warnings to Flight Crews about Birds and Wildlife

FAA began conducting research on the use of radar for bird avoidance in 2000. The goal is to determine if low-cost radars can reliably detect birds at airports, or within 3-5 miles of an airport, and develop an airport bird strike advisory system. The information might be transmitted directly to the cockpit to help pilots avoid large flocks of birds, and/or be provided to the airport operations center.

The FAA, in conjunction with the University of Illinois, is currently evaluating the use of radar for such purposes at several airports around the country including Seattle-Tacoma International and it is planned for several more, including Chicago O'Hare, Dallas-Fort Worth, and John F. Kennedy International airports. We encourage the use of this technology to help increase pilot awareness of in-flight bird hazards. That will represent a significant improvement over the warnings issued to pilots today, which are generally limited to a blanket statement that bird activity is present in the area.

Training on Aircraft Ditching and Evacuation

Pilot and flight attendant training for ditching and subsequent evacuations is required by Federal Aviation Regulations (FAR's). FAR Part 121 requires that airlines demonstrate the effectiveness of their evacuation training and dictates an extensive list of training tasks. The FAA-required list of trained tasks includes:

- Donning, use, and inflation of individual flotation means, if applicable;
- Cockpit preparation and procedures;
- Crew coordination;
- Passenger briefing and cabin preparation;
- Donning and inflation of life preservers;
- Use of life lines; and
- Boarding of passengers and crew into raft or a slide/raft pack.

We believe that the FAA and industry should, based on the final outcome of the investigation into this accident, examine whether these provisions are adequate or whether they should be strengthened.

FAA does not require the use of an actual airplane to train for ditching and evacuation. Generally, cabin and exit mock-up training devices are acceptable if they meet certain criteria. A company that does not conduct extended over-water operations (i.e., more than 50 nautical miles from the nearest shoreline; unless waivered for a greater distance) is not required to conduct training in the use of life rafts.

A Notice of Proposed Rule-Making (NPRM) was published in the Federal Register January 12, 2009 covering pilot, flight attendant and dispatcher training and qualification. This NPRM proposes changes to the frequency of recurrent emergency training. It proposes that pilots receive training on emergencies every 36 months instead of every 24 months, and that flight attendants receive training every 12 months instead of every 24 months. These proposed FAR changes are probably appropriate due to the fact that the items trained are more likely to be used by flight attendants than pilots and it allows more time for pilot training to cover other situations that they are more likely to encounter.

ALPA strongly encourages harmonization between pilots and flight attendants during emergency procedures training. In fact, some airlines actually conduct portions of emergency training in combined classes with both pilots and flight attendants in attendance, which we fully endorse.

Water landings are not practiced in the simulator as part of pilot training. Aircraft certification does not require water landings and manufacturers do not actually land real airplanes on the water to validate their ditching design considerations, nor should they be required to do so. Since flight simulators use "real world" data from flight tests, there is insufficient data to enter into a simulator to make it replicate a water landing. Therefore, aircraft manufacturers only provide general guidance on ditching procedures which is published in flight manuals. Aircraft ditching and evacuation training is typically done as part of ground school and some airlines also cover aircraft ditching preparation in initial aircraft training.

With virtually an unlimited number of circumstances that might lead a crew to ditch an aircraft, it would be of little use to require pilots to carry out detailed ditching exercises more frequently than is required by existing regulations. Statistics show that ditching an aircraft, US Airways Flight 1549 notwithstanding, is an extremely rare event.

Training for Abnormal and Emergency Situations

ALPA believes that emergency procedures training required by the FAR's and provided by the airlines – which includes ditching – is generally proportional to the risk and does a good job of preparing crewmembers for these events.

However, there is always room for improvement; airlines should make additional efforts to train to proficiency, which means that the student is instilled with more than just the ability to effectively follow standard operating procedures (SOPs) and checklists. It requires training that teaches the rationale behind the SOPs, why the checklist tasks are in a particular sequence, the risks in not following them correctly, and so forth. This provides a level of understanding that helps pilots make good decisions when time does not allow reference to checklists, or when confronting a situation not covered by a checklist.

It is impossible to predict how a bird(s) striking an aircraft will affect any given flight. Therefore, training must be more general to address the potential loss of an engine(s) regardless of the cause.

While it is important for pilots to be trained thoroughly in the use of the aircraft's automation, the US Airways Flight 1549 accident highlights how airline flight training programs for pilots must continue to place a high priority on the ability to "hand-fly" the aircraft. Hand flying proficiency ensures that pilots will be able to handle the aircraft manually when necessary.

It has become more and more difficult for airlines to cover all the flying skills necessary during recurrent training. This training must be accomplished in just four hours, an amount that has not changed in 40 years, despite the fact that the number of subjects – which range from new types of approaches, emergencies, and abnormal operations plus "hot button" issues – covered in new and recurrent training has greatly increased in that

time. Frankly, the time allotted for pilots' recurrent training has been reduced in the ever-pressing economic environment to save money, even while the aircraft and operating world has become increasingly complex and challenging.

The training NPRM mentioned previously proposes to increase recurrent training periods to 8 hours in length. Despite the increased time between training events proposed for captains, this change will provide more actual training if it is adopted as written and should provide greater ability to evaluate automation and basic flying skills, and emergency and abnormal procedures.

Airport Wildlife Management

While birds and wildlife will always be a hazard to aviation, it is possible for airplanes to co-exist with a manageable degree of risk. Airport operators play a critical role in mitigating the threat posed by wildlife hazards because airfields are often positioned near areas that attract birds, such as water/marshlands or landfills.

Several years ago, a DeHavilland Dash-8 aircraft was on approach for a night landing on a lakeside runway in Canada when its lights illuminated a flock of Canada geese resting on the runway threshold. The crew had received no prior warning of their presence. Startled by the landing lights, the birds took flight and were struck by the aircraft causing severe damage to both propellers and the shut-down of one engine. If a go-around had been attempted, it would almost certainly have resulted in a hull loss, significant injury or death. Fortunately, the aircraft landed safely, with no loss of life.

This event illustrates the value of a properly administered airport Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near an airport. If one had been in place in this instance, it may well have prevented this potentially catastrophic incident. Regular surveillance of runways and airfields, particularly at night or in low visibility conditions, can alert airport authorities and air traffic controllers to the presence of wildlife, precipitating timely follow-up action to clear the hazard and alert flight crewmembers with specific information regarding the hazard.

Numerous means are available to airport operators keep birds and wildlife away from aircraft which include:

- Lasers
- On-airport startling devices
- Relocation of wetlands and other attractants
- Use of natural predators (e.g. falcons)

Other technologies such as millimeter band radar or infra-red cameras can be employed to identify an unwanted presence of birds and wildlife on the airfield. Both are undergoing trials at North American airports and show great promise. The experiments are intended to assist the FAA in developing standards for technologies intended to spot and track birds moving in the vicinity of an airport. Once a warning is received, the

airport must act to remove or reduce the hazard and should, if appropriate, notify flight crews so that they may endeavor to avoid it.

Because we will not eliminate the hazard of bird and wildlife strikes, we must continue to reduce the risk it presents by identifying effective mitigation methods. ALPA recommends that the government and industry continue to work together and give greater emphasis to such areas as:

- Improved wildlife management and control techniques
- Reporting/statistics in relation to safety management systems
- Training in airport wildlife management
- Aircraft engines/components performance and standards as related to wildlife hazards
- Policies/standards for airports and aircraft operators related to wildlife hazards
- Land use and environmental issues impacting airports
- Remote sensing/modeling to detect and predict bird numbers and movements

Thank you again for the opportunity to testify today. I would be pleased to address any questions that you may have.

# # #

ALPA WHITE PAPER
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Wildlife Hazard Mitigation Strategies for Pilots

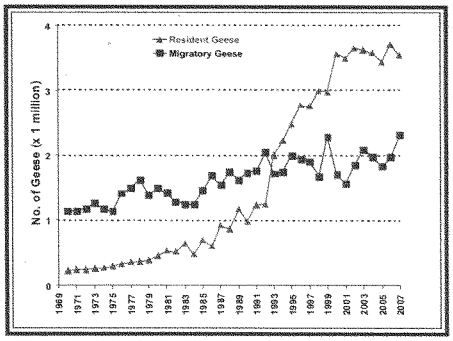
February 2009

Executive Summary

From the very beginning of powered flight, pilots have competed with birds for airspace, sometimes with disastrous results.

Over the years, there have been many efforts to create a better way to "see and avoid" birds and wildlife on the ground and in flight. Several aspects of modern transport aircraft have been designed to reduce the risk associated with the hazard of bird and other wildlife strikes. However, certain attributes of these aircraft make them more vulnerable to damage, including high-speed operations, large engine inlets, and large airframe sizes.

To complicate the issue, the number of birds and their size are both increasing. Conservation efforts have resulted in the resurgence of a variety of species. While this offers an ecological benefit, it also creates a major issue for aircraft. Large flocking birds such as geese and other waterfowl are of particular concern, as each individual bird is capable of destroying an aircraft engine. When the hazard is multiplied by several hundred birds in a flock, the problem is greatly exacerbated.



Canada goose population and strike trends—Dolbeer and Seubert, 2007

This paper is intended to inform airline pilots of the risk posed by bird and wildlife strikes, the kinds of actions that airport authorities may take to limit this risk, and, finally, what specific actions they and their companies can take to further reduce the risk.

ALPA White Paper
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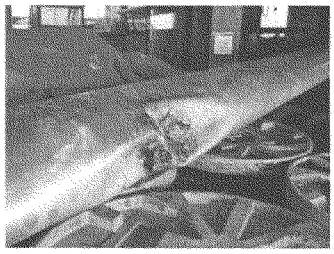
Wildlife Hazard Mitigation Strategies for Pilots

Bird Strikes—Dangerous and Expensive



The first recorded bird strike was reported by the Wright brothers in 1905. According to their diaries, "Orville ... flew 4,751 meters in 4 minutes 45 seconds, four complete circles. Twice passed over fence into Beard's cornfield. Chased flock of birds for two rounds and killed one which fell on top of the upper surface and after a time fell off when swinging a sharp curve." The first recorded bird strike fatality was reported in 1912 at Long Beach, California, when aero-pioneer Cal Rodgers collided with a gull that became jammed in his aircraft controls, causing him to crash.

Although few, if any, pilots desire to intentionally chase birds today, not much progress has been made in helping pilots avoid bird strikes either. Annually, bird and other wildlife strikes cause in excess of 1.2 billion USD damage to civilian aircraft around the world. In the United States alone, the FAA estimates some $600 million annually in damage and associated costs. Although bird strikes that result in commercial aviation fatalities are rare, this risk has brought down several aircraft and has seriously damaged many more.

Most reported bird strikes to civil aircraft in the U.S. occur in the airport environment at low altitudes[1]:

- 92% of all strikes occur below 3,000 feet AGL.
- 42% of reported strikes to civil aircraft in the United States occur on the ground during takeoff or landing.
- 73% of strikes occur at less than 500 feet above ground level (AGL).
- 2,014 strikes occurred above 5,000 feet AGL between 1990 and 2007.
- The U.S. record height for a civil aircraft strike is 32,500 feet.

Both the probability and severity of bird strikes is increased for transport aircraft compared to smaller, slower aircraft, due to a number of factors[2]:

- Operating speeds are higher, reducing the time available to observe wildlife activity and increasing potential impact force and damage should a bird strike occur.
- The physical size of these aircraft means more airframe is exposed; an encounter with a flock of birds might lead to damage at numerous locations on the aircraft.

[1] Source: *Wildlife Strikes to Civil Aircraft in the United States, 1990–2007* (Federal Aviation Administration and Department of Agriculture, June 2008).

[2] Source: *Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards* (Transport Canada, 2nd edition, March 2004).

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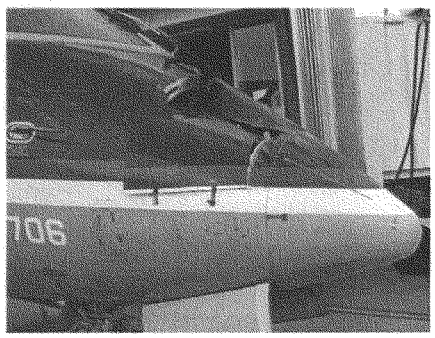
- The aircraft are larger and less maneuverable, making evasive action difficult.
- Large aircraft provide a greater opportunity for multiple bird strikes while flying through a flock of birds. Cockpit location can restrict visibility, limiting the ability to see birds and mammals.
- The extreme workload during critical flight phases means the flight crew has limited time in which to observe wildlife activity.
- Use of alternate runways to avoid bird concentrations at busy airports can lead to significant delays. Commercial aircraft operating from busy airports are subject to tight schedule constraints; arrival and departure flexibility is limited when attempting to avoid wildlife activity.
- In the takeoff phase, commercial aircraft are frequently governed by published departure procedures and noise and traffic-management requirements, limiting the ability to adopt alternate flight paths to avoid areas of bird activity.
- In the approach and landing phase, constraints are similar to those for takeoff and climb. Flight profiles are governed by published approach procedures. At large airports, sequencing high volumes of traffic further restricts flight path flexibility.



Airports in the United States and Canada are required to take proactive measures to reduce the potential for bird and wildlife strikes on or near their facilities. The Federal Aviation Administration (FAA) requires commercial service airports to conduct wildlife hazard assessments and implement a wildlife hazard management plan, if warranted. Airport operators scare birds and wildlife away from aircraft operating areas using such measures as air guns, lasers, and wildlife patrols, and they use fencing and extermination to reduce the threat posed by large mammals such as deer. While these measures can be useful for reducing the number of strikes on the airport surface or near the airport, they may do little or nothing to prevent bird strikes encountered by aircraft on an approach to, or climbing out from, an airport.

FAA began conducting research on the use of radar for bird avoidance in 2000. The goal is to determine if low-cost radars can reliably detect birds at airports, or within 3–5 miles of an airport, and develop an airport bird strike advisory system. The information might be transmitted directly to the cockpit to help pilots avoid large flocks of birds, and/or be provided to the airport operations center. The FAA is currently evaluating the use of radar for such purposes at several airports around the country, and it is planned for several more, including Chicago O'Hare, Dallas–Fort Worth, and John F. Kennedy International airports.

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Pilot Procedures and Vigilance

While the airport operator is responsible for taking action to reduce the potential for bird and wildlife strikes on its facilities, the pilot in command is ultimately responsible for taking every reasonable precaution to operate safely. For that reason, wildlife avoidance techniques and guidance, such as that in the Aeronautical Information Manual (AIM), should be included in flight operations manuals, training materials, and other company guidance for flight crew. However, anecdotal evidence suggests that some companies may not provide any such guidance at all. In a nonscientific survey conducted at an international bird strike conference in 2007, all flight crew attendees participating in a discussion of operational avoidance methods were asked if any guidance had been provided to them by their respective flight operations departments. Without exception, the answer was an emphatic "NO."

Mitigation strategies that may be employed by flight crews range from simple tactics to more complex, and possibly more costly, solutions. For example, if birds are observed near the departure runway, takeoff can be delayed until the pilot notifies ATC and the hazard is removed. In this case, a relatively simple and low-cost procedure can easily be used by the flight crew to reduce the hazard for *their* takeoff. The same technique may need to be used by the flight crew of other departing aircraft as well.

The same process can be used for landing, but it is generally more difficult to visually identify bird and wildlife hazards while on approach. Consequently, it is imperative for all crews to report any birds or other wildlife hazards that they observe on their landing, in order to enable ground personnel to attempt to remove them and provide real-time information to following aircraft. If a serious hazard is present, the landing runway may be changed or an approach abandoned to afford ground personnel time to employ removal tactics.

Some regulators provide information on bird migration patterns and numbers, along with species types and approximate annual times of migration. While this data may offer useful information to ornithologists, it is not of much "real time" use to flight crew members. Likewise, repetitive, generic warnings such as ATIS broadcasts stating, "Migratory birds in the vicinity of the airport" provide pilots with little useful information. What is needed is timely, specific information on where the birds are *now* and how that information relates to the approach or departure being flown. If necessary, to avoid the threat, a different approach could be flown to another runway, a missed approach could be flown to allow ground personnel time to remove or reduce the hazard, or a different runway could be used for takeoff.

One example of an accident that might have been avoided had better information been available to the flight crew occurred November 5, 2000, involving a Dash-8 on approach at night to runway

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08 at Toronto's City Centre Airport. Just as the aircraft flared to land, the landing lights illuminated a flock of Canada geese resting on the threshold. The birds, startled by the landing lights, flew up, and as a result, the aircraft suffered numerous bird strikes and severe damage to both propellers and one engine. The vibration at idle power almost shook the engine from its mounts until it could be secured. Historical data from past investigations indicates that if a go-around had been attempted, it very well may have resulted in a hull loss. Regular inspections of the landing runway, particularly at night or when the runway is not visible from the tower or FSS, can alert airport authorities to the presence of wildlife at the airport. This event also demonstrates that wildlife strikes can be dangerous even at lower speeds.

There are some excellent wildlife avoidance and risk-mitigation recommendations for pilots in the Transport Canada publication *Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards* (2nd edition, March 2004):

Pre-start

- Prior to engine start, review emergency procedures pertinent to your aircraft type and operation. Pay particular attention to rejected-takeoff and engine-failure procedures.

Taxiing for Takeoff

- Takeoff is a critical phase of flight; strike statistics show that 31% of bird strikes and 39% of mammal strikes occur during this phase.
- Be alert while taxiing for takeoff and note any bird and mammal activity reports by ATS providers and other operators.
- While taxiing, report wildlife activity observed on ramps, taxiways, and runways to ATS providers, UNICOM, and other aircraft.
- Be especially vigilant when operating at airports that either do not have ATS providers or have limited hours of ATS operation. Often, these airports have no formal wildlife monitoring or management. Prior to takeoff, it may be necessary to back-taxi the length of the active runway to ensure that there are no birds or mammals.

Takeoff

- Be aware of conditions that may affect your ability to either reject the takeoff or continue flying under reduced aircraft performance.

- Before commencing takeoff, check the runway once more for wildlife; many birds stand on concrete and asphalt surfaces to warm themselves and to gain a clear view of any approaching predators.
- Be aware that an aircraft taking off in front of you may frighten birds and mammals into your flight path.
- If there is bird activity on the runway, be prepared to wait for wildlife management personnel to clear the birds. If traffic and weather conditions permit, use another runway. Wildlife hazards should be treated like any other flight safety hazard—if any doubt exists concerning safety, delay your takeoff until conditions are right.
- Use landing lights during takeoff. Although there is no conclusive evidence that birds see and avoid aircraft lights, limited data and anecdotal evidence suggest landing lights—particularly pulsed landing lights—make the aircraft more visible to birds and provide more time for the animals to avoid the aircraft.
- Aircraft weather radar are not effective as a means of warning birds; they do not sense the low power emissions and frequencies of these units.
- Select engine ignition "on" for takeoff to enhance engine flameout protection when operating turbine-powered aircraft in the presence of birds.
- Should a bird or mammal strike occur during the takeoff roll, a rejected takeoff is the safest course of action when prevailing conditions are appropriate. When safe, vacate the runway and shut down aircraft engines. Before continuing the flight, have the aircraft thoroughly inspected, preferably by an aircraft maintenance engineer (AME).

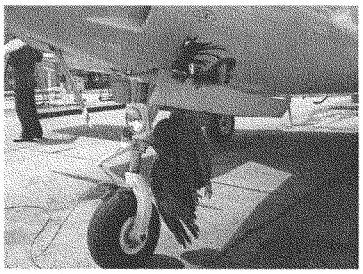
Climb-Out

- Be prepared to adjust your climb route to avoid birds.
- The best way to reduce the probability of a bird strike is to maximize rate of climb on departure. [Pilots of] jet aircraft should use the ICAO Vertical Noise Abatement Profile 'A' (VNAP 'A'). [*Note*: ALPA does not endorse using any profile that differs from those approved for use by the pilot's airline employer.] The benefits are:
  - low aircraft speed (V2 + 10), which reduces impact force. The most effective way to reduce the severity of a bird strike is to reduce speed. Bird-impact force increases as the square of speed; doubling speed increases the impact force by a factor of four;
  - rapid climb rate to get above where most bird strikes occur (below 3,000 ft. AGL) as quickly as possible; and,
  - climb-out occurs as close to the airport boundary as possible, where bird activity is managed.

  [*Note*: Pilots should consider that an increased deck angle that results from a steeper climb may make it more difficult to see and avoid birds.]
- If there is an altitude band where birds are anticipated, climb through these altitudes as quickly as possible, using the manufacturer's recommended best rate of climb speed.
- The majority of bird strikes occur below 10,000 ft AGL, so continue to use landing lights during climb until above this altitude.

- Use extreme caution if accelerating above 250 knots below 10,000 feet ASL. In Canada and some other countries, aircraft may accelerate above 250 knots above 3,000 feet AGL. This increases the probability of a bird strike, since climb rate is reduced while accelerating, thereby increasing time spent in altitudes where birds are more likely to be present. The potential severity of a strike also rises, since impact force increases. Bird strikes above 3,000 feet AGL occur less frequently, but the majority of these strikes involve larger birds and incur frequent and significant damage.

En Route



- Listen to the appropriate en route radio frequencies to obtain up-to-date information on bird activity from ATS providers and other aircraft.
- Report all hazardous bird movements to ATS providers and other aircraft.

Approach and Landing

- Approach and landing is a critical phase of flight. Strike statistics show that 39% of bird strikes and 58% of mammal strikes occur during approach and landing.
- Obtain the latest bird and mammal activity information from ATS providers, ATIS, UNICOM, and other aircraft.
- Be especially vigilant when operating at airports which either do not have ATS providers or have limited hours of ATS operation. While these airports often do not feature wildlife monitoring and management, it is nonetheless prudent to request that airport personnel inspect the runway environment to ensure it is clear of hazardous wildlife. Watch for wildlife activity throughout approach and landing.
- Plan your descent and approach route to avoid areas that attract birds.
- During descent and approach in areas with high bird activity, reduce airspeed to diminish the severity of potential bird strikes.
- If bird activity is reported at particular altitudes, use a higher rate of descent—without increasing speed—to minimize exposure to potential bird strikes.
- Wildlife hazards during approach and landing should be treated like any other flight safety hazard—if any doubt exists concerning safety, delay your landing until conditions are right.
- If birds are encountered on the approach, consider a go-around and a second approach, but only if the go-around can be initiated without striking birds after power is increased. This strategy may allow the birds to disperse before your return. Please note that several bird-related incidents and fatal accidents have resulted from pilots initiating a go-around when the aircraft was in a low energy state and likely capable of a safe landing.

- Use landing lights during approach and landing to make the aircraft more visible to birds.
- If you encounter birds or mammals, be sure to report this activity to ATS providers, UNICOM, and other aircraft.

Conclusions

While the risk of aircraft striking birds and wildlife will always be a part of aviation, the risk is manageable with prior planning and vigilance by airports, airlines, and the flight crew.

Airport operators have a responsibility to ensure that all appropriate actions are taken to mitigate the potential for bird and wildlife strikes at their facilities.

Airlines should recognize the risks and costs associated with bird and wildlife strikes and include avoidance techniques in flight operations manuals, training materials, and other flight crew guidance.

Air traffic controllers should provide as much information to pilots about wildlife hazards within their area of control as workload permits so that pilots can take appropriate precautions. Generic, repetitive warnings about wildlife within an area do not suffice for this purpose.

Testimony of Mark Reis,
Managing Director, Seattle-Tacoma International Airport
Board Member, Airports Council International-North America

before the

House Subcommittee on Aviation

"Wildlife Strikes—How Airports are Helping to Manage the Risks"

February 24, 2009

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Chairman Costello, Ranking Member Petri, and members and staff of the House Subcommittee on Aviation, thank you for allowing me to participate in this important hearing. My name is Mark Reis, and I am Managing Director of the Seattle-Tacoma International Airport (Sea-Tac). I also serve as a Member of the Board of Directors of Airports Council International-North America (ACI-NA). ACI-NA's 366 member airports enplane more than 95 percent of the domestic and virtually all of the international airline passenger and cargo traffic in North America. Nearly 400 aviation-related businesses are also members of ACI-NA, providing goods and services to airports.

We were all transfixed by the skill and professionalism of Captain Sullenberger and First Officer Skiles when they were able to land US Airways Flight 1549 in the Hudson River on January 15 after their A320 jetliner ingested birds into both of its engines. The successful evacuation of the flight by Captain Sullenberger, First Officer Skiles, and flight attendants Walsh, Dail, and Dent following the emergency landing testifies to the intensive training and consummate professionalism of our nation's airline flight crews. The Flight 1549 accident clearly highlights the threat to aviation safety from wildlife. I am here today to describe how airports have been working over almost five decades to reduce these risks within the confines of multiple federal, state, and local laws and regulations, and to highlight some of the challenges airports face while implementing wildlife hazard management programs.

Understanding Wildlife Strike Risks

Before discussing these efforts, it is important to underscore what is known about wildlife hazards with reference to the United States civil aviation industry, and to recognize that these

data are limited to what has been voluntarily reported to the Federal Aviation Administration (FAA), primarily by airport operators and the airlines. The aviation community has widely recognized that the threat to human health and safety from aircraft collisions with wildlife, called "wildlife strikes," is increasing. This increase is especially noticeable since 1990 when the FAA began formally tracking these events using uniform guidelines to ensure each strike record was adequately screened to avoid any duplicate records in the FAA National Wildlife Strike Database.

Of the over 82,000 wildlife strikes reported during the 18-year period from 1990-2007, about 85 percent of these involved commercial aircraft with the remainder spread among business, private, and government aircraft. The number of strikes annually reported to the FAA has more than quadrupled from 1,759 in 1990 to a record high of 7,666 in 2007. This increase is thought to be a result of several factors: (1) an increased awareness that the FAA and airport operators are interested in receiving wildlife strike reports when they occur, (2) an increase in the number of civilian aircraft operations, and (3) an increase in population sizes of some wildlife species. Although birds are involved in nearly 98% of the strikes, other wildlife, such as deer, elk and alligators, in addition to smaller animals such as coyotes, have also been struck and are known to cause aircraft damage.

One of database's most important contributions is information on aircraft altitude when these collisions are occurring: While the record height for civil aircraft striking a bird in the U.S. is 32,500 feet above ground level (AGL), strikes at altitudes above 10,000 ft AGL are known to be rare. Rather, these data show most strikes (92%) occur below 3,000 feet AGL with a majority (60%) occurring at 100 feet AGL or less. Consequently, FAA Advisory Circular 150/5200-33B,

addressing hazardous wildlife attractants on and near airports, stresses the need for airport operators to avoid, eliminate, or mitigate certain wildlife within at least 10,000 feet of the airport boundary, the area where most aircraft wildlife collisions occur.

Fortunately, wildlife strikes resulting in very serious consequences for non-military operations—as was the case for Flight 1549—have been very rare. From 1990 through 2007, the FAA has received reports of 43 aircraft hull losses—which include aircraft that crashed as well as those determined to be unflyable following the strike—as a result of wildlife strikes. Only two of these hull losses involved commercial aircraft. Over that same time, 840 million landings and takeoffs took place, representing one civilian aircraft lost for every 1.9 million landings and takeoffs. Injuries and fatalities caused by wildlife strikes were also rare—197 injuries and 16 fatalities were attributed to wildlife strikes between 1990 and 2008. During this same period, there were over 12 billion commercial passengers enplaned in the U.S., a number that would be even higher if data were available regarding the number of individuals that flew on non-commercial aircraft.

Not only can wildlife strikes be hazardous, they can also be costly. As noted by the FAA in 2004, wildlife strikes worldwide cost civil aviation an estimated $1.2 billion annually.[1] More recent statistics released by the FAA indicate that strike-related damage and aircraft downtime cost the U.S. aviation industry $625 million per year. I recognize that even one injured passenger is cause for concern, and while these statistics show that wildlife strikes are rare, we agree that because this problem is increasing, additional attention is merited.

[1] Advisory Circular 150/5200-32A, *Reporting Wildlife Aircraft Strikes*, FAA, December 22, 2004.

Airports Efforts to Mitigate Wildlife Hazards

Airports are important partners with the FAA and the U.S. Department of Agriculture, Animal and Plant Inspection Service, Wildlife Services (USDA Wildlife Services) in mitigating the risks that wildlife—particularly certain bird species—pose to aircraft operations. U.S. commercial service airports[2] are required under 14 CFR 139.337 to "undertake immediate action to alleviate wildlife hazards whenever they are detected." Airports are also required to have a qualified wildlife biologist conduct a wildlife hazard assessment in the event that an air carrier aircraft ingests wildlife into its engines, is substantially damaged by a wildlife strike, or experiences multiple wildlife strikes, or wildlife are observed in a manner that could cause an aircraft to experience one of those situations. The FAA reviews the assessment and determines whether the airport must develop a wildlife hazard management plan, which becomes a part of the operator's Airport Certification Manual. These plans contain specific actions that an airport will undertake to attempt to minimize or eliminate wildlife hazards through habitat modifications, land use changes, and wildlife population management. The plans must also include a training program conducted by qualified experts to provide airport staff with the knowledge and skills needed to implement the management plan.

In addition to these regulatory minimums, many U.S. airports have proactively undertaken their own wildlife hazard assessments and management plans to help manage safety risks at their facilities.

[2] Defined as airports that that serve any scheduled or unscheduled passenger operation by an air carrier with aircraft having a capacity of more than nine passengers.

The costs of wildlife management programs vary considerably from airport to airport depending on their size, location, and surrounding habitats; some airports spend $250,000 or more per year on their programs. Funds from the FAA's Airport Improvement Program (AIP) can be used to pay for a portion of costs associated with habitat modification projects and wildlife management equipment. However, staff costs, contractor fees, and other operating expenses associated with wildlife management programs are typically not eligible for federal funding and are borne by airports themselves.

Numerous methods are available to airports to mitigate wildlife hazards. One method that is typically employed includes habitat modification that can entail draining stormwater ponds, eliminating wildlife-attracting vegetation, and maintaining specified airfield grass heights. Airports also use wildlife exclusion methods, including netting, fencing, and installing floating covers over stormwater ponds. Scare tactics through the use of loud pyrotechnic devices, propane cannons, sirens, dogs, falcons, and non-lethal projectiles can also be beneficial to keeping wildlife away from airports. Furthermore, some airports have found capturing and relocating some species to be a useful mitigation method. Lethal removal, a method which requires a depredation permit under the Migratory Bird Treaty Act and is administered by the U.S. Department of the Interior's Fish and Wildlife Service, may also be necessary provided that endangered or threatened species are not involved and that it is done as a part of an integrated wildlife damage management program that first employs non-lethal techniques such as pyrotechnics and other scare tactics to mitigate wildlife hazards.

Sea-Tac Wildlife Management Program

At Sea-Tac, we have an extensive program in place to manage wildlife hazards. Sea-Tac is located in a highly urbanized area of Western Washington, two miles east of Puget Sound and in one of the four major migratory bird flyways found in North America. Sea-Tac has an advantage in that most of the significant wildlife habitat surrounding the airport, comprised of wetlands and forested areas, lie well below runway grade and away from the flight path of aircraft. Over the last three decades, progress has been made in reducing the attractiveness of the airport for wildlife habitation, while restoring much of the areas naturally occurring hydrologic and ecological functions. Across the country, however, wildlife issues remain as populations of some urbanized wildlife species continue to increase, thereby raising the risk of another serious aviation wildlife-related incident.

Sea-Tac's wildlife program began in 1977 when the U.S. Department of the Interior's Fish and Wildlife Service and the U.S. Air Force conducted the airport's first wildlife hazard assessment. At the time, flocks of over 50,000 European starlings were creating a serious aviation risk. The airport's organized wildlife hazard management program began with the hiring of its first airport wildlife biologist. Following establishment of the program, the number of European starlings was eventually reduced dramatically to safer levels through shooting, vegetation management, and live-trapping. In June 1989, Sea-Tac developed the first FAA-recognized wildlife hazard management plan, which has since been updated five times, most recently in 2008. In 1999, the USDA Wildlife Services actively participated in planning for the airport's 3rd runway, advising the airport on how to safely mitigate wetland losses and

stormwater detention requirements in a manner that did not increase the incidence of hazardous birds, such as waterfowl, at the airport.

Costs related to damaging wildlife strikes at Sea-Tac have remained relatively low at several hundred thousand dollars per year. Adding to the cost, a few precautionary landings occur annually. Strikes occurring at the airport per year ranged from 4 in 1977 to nearly 100 in 2008. The increased number of strikes has been attributed to several factors:

- The increased number of operations at Sea-Tac, now ranked 18th in the U.S.,
- Increased reporting of strikes after awareness was raised that FAA and the Port of Seattle are interested in receiving reports from airlines,
- Quieter aircraft engines, and
- Increased abundance of large and/or flocking birds and other wildlife species such as Canada geese, gulls, some hawks, and bald eagles.

Sea-Tac has implemented a number of measures to prevent wildlife strikes. First and foremost, habitat management has always been the main focus of the airport's efforts to reduce wildlife numbers and hazards to aviation. Sea-Tac has implemented several vegetation-related practices to prevent and manage wildlife habitat. The only plants the airport allows for landscaping are those that do not produce fruits, nuts, or berries. Xeric or low water-using plants are encouraged to avoid the need for irrigation. Grass is kept at an optimal height to decrease wildlife use of the airfield for food and cover. Sea-Tac has also worked to develop it own specialized grass mix to help dissuade waterfowl, especially geese, from using the airfield. Additionally, other than grass, no other plants are allowed inside the airport operations area

(AOA) fence, while an increasing variety of approved plants are tolerated at greater distances from the runways.

One of the best examples of the challenges airports face balancing safe airport operations and environmental mitigation requirements is found in the Airport's years of planning efforts and subsequent implementation of wetland mitigation and stormwater management practices. With the development of Sea-Tac's 3rd runway, extensive stormwater and wetland mitigation was required by the state and federal permitting agencies. The requirement for on-airport stormwater and wetland mitigation created a set of conflicting mandates that required close coordination of multiple agencies to resolve. After years of negotiation, a package of mitigation measures was agreed to that met the environmental requirements, and, at significant additional cost, also met the airport's wildlife hazard management mandates. Wetland impacts were mitigated by focusing on the replacement of different wetland functions in different locations.

Near the airport, hydrologic functions were restored in several watersheds, while also substantially reducing wildlife attractants. On-airport wetland mitigation sites were designed to have a heavy closed canopy of trees or shrubs covering open water that would otherwise attract birds. Five miles from the airport a 70-acre wetland mitigation site with open water and wildlife habitat was created to mitigate for lost bird habitat on airport property. This allowed the airport to mitigate for the lost avian habitat, but to do so in a safe location that did not risk aircraft bird strikes.

Stormwater management requirements have created another challenge for Sea-Tac, requiring the balance of conflicting mandates for stormwater detention and wildlife hazard control. For example, open ponds used to detain stormwater attract birds. Our challenge was to design and operate these ponds in a way that minimized bird attraction. Over a several year period the airport worked with the FAA and USDA Wildlife Services to identify a best management practice that was the most cost-effective means of mitigating hazardous wildlife attractants at stormwater detention facilities while keeping long-term maintenance costs to a minimum. As a result, today most of the airport's stormwater ponds are lined to prevent excessive emergent vegetation growth and fully netted to prevent wildlife access.

In addition to habitat management, Sea-Tac and other airports undertake a variety of control actions to manage wildlife hazards. The first of these control actions is wildlife harassment. The airport holds permits issued by the U.S. Department of Interior's Fish and Wildlife Service that allow us to harass bald eagles, relocate raptors (hawks, owls, and ospreys), and lethally remove individual migratory birds that lose their "fright-flight" response. We try to maintain the fright-flight response with pyrotechnics, other noise-making/scare devices, and live rounds. Tens of thousands of birds are harassed annually by over 25 airport operations personnel and contractors trained in the use of pyrotechnics and firearms to keep wildlife separated from landing and departing aircraft. In response to coyotes, the airport has installed a new fence that has a buried section to keep coyotes outside of the active airfield. Importantly, lethal removal of native wildlife is almost never used to decrease wildlife abundance; it is used, however, to reinforce the fear response that is needed to keep the airport's scare tactics effective.

Radar Technology Is Being Tested

As has been widely reported, Sea-Tac, in cooperation with researchers at the University of Illinois, is exploring enhanced monitoring through use of an avian radar system. First installed in August 2007, the airport now uses 3 Accipiter-Sicom avian radar systems. Radar systems will soon be evaluated at Chicago O'Hare, Dallas/Fort Worth, and John F. Kennedy International Airports. Following the US Airways emergency landing, the Port Authority of New York and New Jersey announced their plans to provide radar detection capabilities at three other airports that they own—Newark Liberty International, LaGuardia, and Teterboro.

These avian radar systems act like a more powerful pair of eyes capable of seeing farther and higher than a human observer that is further restricted to daylight observation periods. This information is being used to help confirm that hazardous bird activity is not increasing near the airport's stormwater ponds and to help identify wildlife trends. Avian radar allows significant bird activity to be monitored on a daily basis and may soon provide useful real time information that can be conveyed to those conducting wildlife control activities on the airfield.

Although these radar systems have shown promise in detecting concentrations of birds in the vicinity of airports, two important question remains: (1) how much information do the air traffic controllers and pilots truly need to enhance safety, and (2) what actions if any should pilots and air traffic controllers take when concentrations of birds are found. As it currently operates today, avian radar is not yet the "silver bullet" as it detects too much bird activity, meaning we need to determine what information is best to pass on immediately to the air traffic controllers. With appropriate information screening, that capability may come -- just as wind

shear radar, a technology that took years to perfect, can now alert air traffic control to hazardous weather events. Research into these systems and the appropriate level of communication with the end users is continuing.

Conflicting Federal, State and Local Regulations Pose Problems

Careful consideration of wildlife hazards during airport planning and development efforts has also helped airports proactively manage wildlife hazards. The FAA provides guidance regarding the relationships between airport development and hazardous wildlife attractants in Advisory Circulars (ACs) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* and 150/5200-34, *Construction or Establishment of Landfills Near Public Airports.* Airports and the FAA apply the guidance contained in these ACs in their analysis and development of airport development alternatives. For example, at Philadelphia International Airport a short-listed runway development alternative was eliminated from further consideration because the proposed runway would require aircraft to fly over a National Wildlife Refuge, unacceptably increasing wildlife strike risks.

Although airports have a large selection of tools to use in managing what occurs on their property, they have fewer tools to use when wildlife issues involve land uses off airport property but in the airport vicinity. Local realities outside of an airport's authority—including local zoning practices, construction and land development permitting procedures, and limited lines of communication between off-airport developers and nearby airports—can result in the construction of wildlife attractants—such as stormwater detention facilities, ponds, or wildlife attracting vegetation—near airports. In other cases, airports are sited near or adjacent to wildlife

refuges, parklands, golf courses, certain agricultural areas, or open water—all of which can attract wildlife.

FAA Advisory Circular 150/5200-33B requires airports to undertake coordination with local jurisdictions and developers on proposed land uses and projects that might increase wildlife attractants at an airport. In accordance with the AC, the Port of Seattle continually seeks to be involved in these land use decisions and to establish and maintain agreements with local jurisdictions where possible. While we have been successful setting landscape standards with the city that surrounds our airport, and have cooperated with local trash transfer stations, golf courses, basin planning committees, and transportation departments, it is important to note this has been only cooperative. We have no direct authority to require any action on their part, which limits our ability to ensure a safe operating environment. Airports would benefit from having stronger, federally-mandated mechanisms to control land uses in the vicinity of their airports.

Baltimore/Washington International Thurgood Marshall Airport (BWI) is a good example of an airport that has been able to influence off-airport land uses to reduce wildlife strikes. Via Maryland laws that govern airport/land use compatibility and close working relationships with local government, the Maryland Aviation Administration—which owns and operates BWI—has worked with Anne Arundel County to specify "wildlife-resistant" design and landscaping guidelines for developments up to four miles off airport property. The airport now plays a critical role in reviewing development plans, both on and off-airport, to ensure wildlife attractants are minimized. However, the approach taken at BWI's—which is predicated in part

on strong state regulations regarding land use in the vicinity of airports—remains more of an exception than a rule in the United States.

Another issue airports face in their efforts to protect against the risks associated with hazardous wildlife is a myriad of complex and often contradictory state and local laws and regulations regarding wildlife management and habitat protection. For example, in some cases state laws restrict the types of trapping methods that airport officials can use to manage wildlife and the use of lethal removal even when such actions are permitted under federal laws. In other cases, laws limit the ability of airports to modify or eliminate attractive habitats on or near airports, even if similar habitat could be provided elsewhere. These issues have had a stifling effect on airport efforts to control hazardous wildlife around the country.

In the case of Sacramento International Airport, the risk of criminal prosecution by state officials resulted in the airport ceasing certain wildlife removal and harassment activities. Airports in Florida have encountered a similar situation and have been working with state legislators to pass legislation that would exempt airport wildlife managers from state and local prosecution.

Within the federal realm, airports also confront contradictory and overlapping regulations. Notable among these are Clean Water Act and National Environmental Policy Act requirements relating to wetlands. These requirements, and the U.S. Army Corps of Engineers Section 404 permitting processes that apply to jurisdictional wetlands, can make it difficult, expensive, and time-consuming for airports to modify wildlife attracting wetlands on and near airports to reduce

their wildlife strike risks. Providing simpler streamlined permitting and environmental review processes in cases where safety is at stake would help airports manage wildlife hazards in a manner that better complied with existing federal aviation regulations.

I would like to acknowledge that over the past decade important headway has been made to simplify the roles and relationships among the myriad federal agencies that are involved with airport wildlife management. In 2003, a Memorandum of Agreement (MOA) was established among the FAA, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the USDA. This MOA established procedures necessary for these agencies to coordinate their missions to more effectively by addressing existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the U.S. Most importantly for airports, the MOA clarified the responsibilities and areas of expertise that each agency was expected to bring to the table when dealing with wildlife hazards at airports. Although MOA did bring needed clarity regarding the missions of the various agencies, at Sea-Tac we have found that that continued work is needed—particularly at the field office level—to ensure all federal agencies involved with wildlife management work with airports in an effective and coordinated fashion to reduce wildlife strike risks.

Finally, airports need funding to implement and maintain effective wildlife management programs. The FAA has provided critically important funding for setting up these programs under the AIP. However, the ongoing operating costs associated with these programs must be funded out of airport operating budgets, which are already under considerable strain in our current economic crisis.

All of these issues required concerted and coordinated efforts among airports, the FAA, USDA Wildlife Services, the U.S. Army Corps of Engineers, other federal agencies, and state and local officials to address.

Conclusion

In summary, U.S. airport operators have been long-standing partners with the FAA and the USDA Wildlife Services in efforts to protect airports from wildlife hazards. Through these and their own proactive efforts, numerous U.S. airports have developed and implemented wildlife hazard management plans to reduce the risks of wildlife to aircraft operations at and near airports. Going forward, the continued development of promising technologies, improved coordination between airports and local developers, closer coordination for wetland and stormwater mitigation for airports, better adherence to the 2003 multi-agency MOA, and harmonization of federal, state, and local wildlife management restrictions may reduce these risks further.

Mr. Chairman and Ranking Member Petri, I would like to thank you again for allowing me to testify about wildlife strikes and what airports are doing to help manage the risks associated with them. ACI-NA welcomes the opportunity to continue working with you to enhance the tools airports have at their disposal to manage these risks. Thank you and I am happy to answer any questions.

Testimony of

Jeffrey Skiles

Before the House Transportation and Infrastructure Subcommittee on Aviation

Hearing on U.S. Airways Flight 1549

February 24, 2009

Chairman Costello, Chairman Oberstar, Ranking Members Mica, Petri and members of the committee, I am honored to appear before the Aviation Subcommittee. I too am proud of the fact that I have been involved in aviation for the last 32 years. Both of my parents were pilots before me. I have over 20,000 hours in the cockpit, have flown as Captain at US Airways in the past, and Captain qualified on 3 different transport aircraft types.

While much has been made of cockpit flight crew's actions in this incident, much credit is due to the experienced and highly trained flight attendants, Donna Dent, Doreen Welsh and Sheila Dail. Without their quick, capable and courageous actions, the outcome that day would have been dramatically different. To work with such professionals is truly an honor for me. Also, the captains and crews of the boats that came to our rescue as well as the first responders at the ferry terminals were a great part of the successful outcome. And finally the passengers themselves, who evacuated the airplane in an extremely orderly, selfless and professional manner, deserve much credit. We have been categorized as heroes; if so, there were many, many heroes on that day.

Like each and every one of my fellow professional airline pilots and flight attendants, I realize that flying a commercial airliner is a tremendous responsibility. The aftermath of this incident has brought forth in me a renewed understanding that this is a job for experienced professionals. Being an airline flight crewmember, whether pilot or flight attendant, is a serious job for serious people, and I am tremendously proud to count myself among their number. The dedication, seriousness and professionalism with which we in the aviation community approach our responsibilities can be credited for the dramatic improvement of our national aviation safety record.

The training, procedures and tenets of cockpit resource management (CRM) developed throughout the airline industry over the last 15 years, played a significant role on January 15th. Training departments industry wide are ceaselessly striving to identify future problems and develop procedures to combat them before they occur. A functional self-disclosure safety program is a valuable tool to identify and track errors. Mutually agreeable solutions to make these programs available are in the traveling public's interest. We must work tirelessly to maintain an unrivaled commitment to safety and professionalism. However, another component of the positive result was the vast experience of the cockpit AND cabin crew.

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Sully and I have over 70 years of experience and 40,000 flying hours between us. New pilots in the jet aircraft of our affiliate airlines have 300 hours. When I began at US-Airways, the Company required several thousand hours just to gain an interview for a pilot position. It is certainly in the interest of the traveling public to have experienced crews in the cockpit.

Along with Captain Sullenberger, I have concerns for the future of the Airline Pilot Profession. Experienced crews in the cockpit eventually will be a thing of the past. What this country has experienced economically in the last 8 months, we have experienced in our industry for the last 8 years, since 9-11. In the wake of these 8 years of financial turmoil, bankruptcies, layoffs, and revolving door management teams, airline piloting careers have been shattered. I personally earn half of what I once earned, AND I have lost my retirement to a PBGC promise that will pay pennies on the dollar. Many pilots like Captain Sullenberger and myself have had to split their focus from the Airline Piloting Profession and develop alternative businesses or careers. I myself am a general contractor. For the last 6 years, I have worked 7 days a week between my two jobs just to maintain a middle class standard of living.

The more than thirty thousand people who work at US Airways are proud of the work they do each day, and of their accomplishments. To many of us, the near total devaluation of our professions by our management is heartfelt. In the last several years the only constant I see is the ever increasing compensation levels of our management.

When I started in this industry there were aviation dynasties. Entire families would be employed in aviation as pilots, flight attendants, mechanics or agents. An aviation career was something people aspired to their entire childhood, as I did. Now I know of NO ONE who encourages their children to enter the airline industry.

From our perspective, it is clear that the current state of the management/ labor negotiation process is broken. Negotiations drag out for years in stagnation with little clarity for those of us who have spent our entire lives training to be on the front lines of safety for the American flying public. We aren't asking for special privileges, but for a level playing field inside the NMB negotiating process. There is not a balance in the negotiating process and the state of the airline piloting profession is proof.

I would respectfully urge members of this subcommittee to work with other relevant committees to promote better balance between airline management and airline employees, especially in the area of creating an environment for efficient and effective negotiations inside the National Mediation Board process, thereby eliminating years of negotiating stagnation. I believe the reforms being considered by the House Judiciary committee can lead to more cooperation and less confrontation. This in turn would certainly help to rebuild an environment that will allow us to concentrate on the safety of the traveling public.

Our colleagues in this industry have rallied around our incident. While Captain Sullenberger and I generally prefer to land at airports, we are proud that the Hudson River landing displayed what well trained, professional pilots and flight attendants can do when faced with tremendous adversity. We are all very gratified and moved that our colleagues in the flying industry have seen this incident as a positive reflection of themselves and our shared profession.

We must ensure that America's proud aviation traditions of transporting our citizens with safety and security does not fall victim to the immense challenges we face. In this, Congress has a role to play. We hope that you will take seriously the challenges that aviation professional's face by helping us to level the playing field, and working with us to protect the airline pilot profession.

We ask that congress be a partner to the men and woman who make up the professionals who move America every day, as well as the companies who employ us. Working together we can ensure that the flight crews of the future will be the best and the brightest, and will have the experience and training necessary to ensure safe air travel to each and every passenger they carry.

Expanded Testimony of

Jeffrey Skiles

Before the House Transportation and Infrastructure Subcommittee on Aviation

Hearing on U.S. Airways Flight 1549

February 24, 2009

Chairman Oberstar, Chairman Costello, and members of the House Transportation and Infrastructure Committee and Aviation Sub-Committee, I am honored and grateful to have the opportunity to submit expanded written testimony for the record relative to the Aviation Sub-Committee Hearing on February 24, 2009. In my previous testimony I have stated the concerns that professional airline pilots in the aviation field have for the future of our profession. Specifically, the concern is the ability to attract talented and dedicated professionals that we will need in the future to fill the airline cockpit seats of tomorrow. This will only be possible if we change our present course.

In many regards the airline piloting profession is experiencing the same issues as the Air Traffic Controllers in as much as both professions are having difficulty retaining and attracting highly skilled and motivated individuals. The difficulties that the controllers are experiencing have been compounded since the FAA imposed pay and work rules in September 2006; the airline piloting profession issues have been compounded since 9-11-2001 as a result of financial pressures and bankruptcies. A career as an airline pilot no longer has the levels of reward commensurate with the training and responsibility that the profession requires. When given other professional career choices, young motivated individuals have difficulty justifying the financial sacrifice inherent in the airline piloting profession. Here at US Airways, when nearly 2000 of our experienced furloughed pilots were offered their job back as professional airline pilots, 60% quit the Company. For a major airline, that fact is unprecedented.

Since the Airline Industry has grown in competitiveness, airline managements have found ways to tip the scales and upset the delicate balance of the negotiating process that is defined inside the Railway Labor Act. Airline labor and managements negotiate interminably with little or no progress. Long term negotiations were certainly never the intention of the RLA, but interminable bargaining has become the norm in the airline industry as managements have accepted stagnation as a goal in its own right. The timeline under which airline labor negotiations progress, has for the most part become increasingly dictated by management. To use an example that I am familiar with, my own airline management delayed the negotiating process for nearly four years before an agreement was reached. Fortunately, there is a legislative solution which can address this issue and once again make the airline piloting profession an attractive career choice for motivated professionals. In this, Congress has a role to play.

We are not seeking a legislative advantage over our managements. We are not seeking for congressionally mandated solutions for our problems. Pilots are willing to shoulder the burden of rebuilding our profession ourselves. What we are seeking is a level playing

field inside the negotiating process thereby following the path originally intended in the Railway Labor Act.

The US Airline Pilot Association (USAPA) has submitted a legislative proposal to do just that by adding timeline guidance to the negotiating process inside the RLA. The concept of the proposal is to initiate negotiations at a minimum of 180 days prior to a contract amendable date and unless both parties mutually request an extension, negotiations will terminate and the Mediation Board will endeavor to induce the parties to submit their controversy to arbitration in accordance with the related chapter in the RLA. This legislative initiative is viewed favorably by other airline employee unions.

While this favors neither party, it does create efficiency, facilitate negotiations and fulfills the original intent of the RLA. The beneficiary of this renewed process in the long run is the traveling public as experienced pilots stay in their positions and motivated professionals are attracted once again to the career field.

There are several other safety issues relative to US Airways Flight 1549 which we feel should be addressed. Every accident is scrutinized by the NTSB for the development of safety improvements that will benefit the traveling public. The NTSB is not, however, a regulatory body and cannot mandate changes in equipment, procedures, or certification standards. This can only come from the FAA or via legislation.

One area which can be addressed is access to life vests. My own airline equips most of their mainline aircraft with life vests for operational convenience. This is not true in the airline industry as a whole however. There is no mandate to have such equipment if the aircraft is not required to fly offshore in the normal course of operation. On January 15th, we had no requirement to have either life vests or life rafts onboard since the aircraft routing did not require them. Our particular aircraft on that flight happened to be equipped and certified for extended over water operations and therefore carried these essential safety items. A mandate to have all aircraft so equipped would be in the interest and safety of the traveling public.

Another area for review is the certification standards for jet engines. There have been a number of instances of bird ingestion causing engine failures, but never has bird ingestion caused such a dramatic failure of both engines simultaneously. Clearly, this is an area that requires further research. The current certification standards only require engines to not have uncontained failures with the ingestion of birds much smaller than encountered in Flight 1549. Birds are an ever present danger to flying aircraft. The experience of Flight 1549 underscores the need for additional research into the certification standards of jet engines with regards to bird ingestion.

Yet a third area requiring scrutiny would be the ratio of slide/rafts to passengers. Structural failure of the aircraft caused the tail to fill with water and sit too low for slide/raft deployment from the rear exit doors. This could have been a serious safety issue had the passenger rescue not occurred in such a rapid manner. While certainly the structural failure will be a focus of the NTSB investigation, consideration should be given to allowing for unusable exits when determining the slide/raft complement.

Many lessons can be learned from an in depth study of the Flight 1549 incident. The most basic of which, would be the importance of attracting and retaining experienced flight crews. While certainly improvements can be made in the areas of certification and regulation, the human element will never be able to be discounted. Orville and Wilbur Wright needed to pilot the very first airplane, and certainly aircraft will need pilots for time to come. By ensuring that trained, skilled, professionals are present in every cockpit, we can ensure the safety of the traveling public for many years.

STATEMENT OF CAPTAIN CHESLEY B. SULLENBERGER, III
CAPTAIN, US AIRWAYS FLIGHT 1549
BEFORE THE SUBCOMMITTEE ON AVIATION
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
UNITED STATES HOUSE OF REPRESENTATIVES

FEBRUARY 24, 2009

Chairman Costello, Chairman Oberstar, Ranking Members Mica and Petri, and other members of the committee, it is my great honor to appear before the Aviation Subcommittee today. I am proud of the fact that I have been involved in aviation for the last 42 years. During that time, I have served our country as a U. S. Air Force pilot, served as an Air Line Pilots Association Local Air Safety Committee Chairman, accident investigator and national technical committee member, amassed a total flying time of almost 20,000 hours and flown approximately one million passengers in my 29 years as a professional airline pilot. I have served as a Check Airman and a Crew Resource Management course developer and facilitator. I am also the founder of Safety Reliability Methods, Inc.

Before I begin, I must first say that my heart goes out to all those affected by the tragic loss of Continental Connection flight 3407. Words cannot express my sadness and grief at the loss of 50 lives. The families of those no longer with us are in my thoughts and in my heart.

The events of January 15, 2009 have been well-documented, and rather than recite them now in great detail, I want only to reiterate to the subcommittee that the successful outcome was achieved by the actions of many. Lives were saved due to the combination of a very experienced, well-trained crew: First Officer Jeff Skiles, and Flight Attendants Donna Dent, Doreen Welsh and Sheila Dail, all of whom acted in a remarkable display of teamwork, along with expert air traffic controllers, the orderly cooperation of our cool-headed passengers, and the quick and determined actions of the professional and volunteer first responders in New York City.

The events of January 15 serve as a reminder to us all of the daily devotion to duty of the many thousands of aviation professionals who keep air travel safe, and also as a reminder of what is really at stake. Like thousands of my fellow professional airline pilots, I know that flying a large commercial airliner is a tremendous responsibility. We understand that our passengers put their lives in our hands. We know that we must always be prepared. We must always anticipate. We must always be vigilant. Expecting the unexpected and having an effective plan for dealing with it must be in the very makeup of every professional airline pilot.

I am not only proud of my crew, I am proud of my profession. Flying has been my life-long passion. I count myself fortunate to have spent my life in the profession I love, with colleagues whom I respect and admire. But, honorable Representatives, while I love my

profession, I do not like what has happened to it. I would not be doing my duty if I did not report to you that I am deeply worried about its future.

Americans have been experiencing huge economic difficulties in recent months – but airline employees have been experiencing those challenges, and more, for the last 8 years! We have been hit by an economic tsunami. September 11, bankruptcies, fluctuating fuel prices, mergers, loss of pensions and revolving door management teams who have used airline employees as an ATM have left the people who work for airlines in the United States with extreme economic difficulties.

It is an incredible testament to the collective character, professionalism and dedication of my colleagues in the industry that they are still able to function at such a high level. It is my personal experience that my decision to remain in the profession I love has come at a great financial cost to me and my family. My pay has been cut 40%, my pension, like most airline pensions, has been terminated and replaced by a PBGC guarantee worth only pennies on the dollar.

While airline pilots are by no means alone in our financial struggles – and I want to acknowledge how difficult it is for everyone right now – it is important to underscore that the terms of our employment have changed dramatically from when I began my career, leading to an untenable financial situation for pilots and their families. When my company offered pilots who had been laid off the chance to return to work, 60% refused. Members, I attempt to speak accurately and plainly, so please do not think I exaggerate when I say that I do not know a single professional airline pilot who wants his or her children to follow in their footsteps.

I am worried that the airline piloting profession will not be able to continue to attract the best and the brightest. The current experience and skills of our country's professional airline pilots come from investments made years ago when we were able to attract the ambitious, talented people who now frequently seek lucrative professional careers. That past investment was an indispensible element in our commercial aviation infrastructure, vital to safe air travel and our country's economy and security. If we do not sufficiently value the airline piloting profession and future pilots are less experienced and less skilled, it logically follows that we will see negative consequences to the flying public – and to our country.

We face remarkable challenges in our industry. In order to ensure economic security and an uncompromising approach to passenger safety, management must work with labor to bargain in good faith. We must find collective solutions that address the huge economic issues we face in recruiting and retaining the experienced and highly skilled professionals that the industry requires and that passenger safety demands. But further, we must develop and sustain an environment in every airline and aviation organization – a culture that balances the competing needs of accountability and learning. We must create and maintain the trust that is the absolutely essential element of a successful and sustainable safety reporting system to detect and correct deficiencies before they lead to an accident. We must not let the economic and financial pressures detract from a focus on constantly

improving our safety measures and engaging in ongoing and comprehensive training. In aviation, the bottom line is that the single most important piece of safety equipment is an experienced, well-trained pilot.

Despite the bad economic news we've experienced in recent times – despite the many challenges we face as a country – I have faith in America, in our people, in our promise. I have briefly touched upon some major problems in my industry today – but I do not believe they are intractable, should we decide to work collectively to solve them.

We all have roles to play in this effort. Despite the economic turbulence hitting our industry, the airline companies must refocus their attention – and their resources – on the recruitment and retention of highly experienced and well-trained pilots, and make that a priority that is at least equal to their financial bottom line. Jeff and I, and our fellow pilots will fly planes and continue to upgrade our education and our training, while we attempt to provide for our families. Patrick and the other talented Air Traffic Controllers will continue to guide us safely through the skies, our passengers will spend their hard-earned money to pay for their travel, and our flight attendants, mechanics, ground crews, and administrative personnel will deal with the thousands of constant details and demands that keep our planes safely in the air.

You can help us, honorable Members of Congress, to work together across party lines, and can demand – or legislate – that labor, management, safety experts, educators, technical experts, and everyday Americans join together to find solutions to these problems. We all honor our responsibilities in good faith and with respect for one another. We must keep the American commercial aviation industry safe and affordable for passengers, and financially viable for those who work in the industry day to day. And for those talented young men and women considering what to do with their lives, we must restore the narrative of a compelling career path in aviation with sufficient economic resources to once again make this vision a reality.

Thank you for your kind attention, and for the opportunity to share my perspective with this Committee.

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Robert L. Sumwalt, III
Board Member

Testimony of the Honorable Robert L. Sumwalt, III
Board Member
National Transportation Safety Board
Before the
Subcommittee on Aviation
Committee on Transportation and Infrastructure
United States House of Representatives

Hearing on the US Airways Flight 1549 Accident
February 24, 2009

Good morning. With your concurrence, Mr. Chairman, I would like to give you a short summary of the Safety Board's activity to date, regarding the investigation of the accident involving US Airways flight 1549.

On January 15, 2009, at 3:27 in the afternoon, US Airways flight 1549, an Airbus A320-214, registered as N106US, experienced multiple birdstrikes following takeoff from New York's LaGuardia Airport. Birds were ingested by both engines and caused a significant loss of thrust. Due to the thrust loss, the airplane was unable to maintain level flight. The flight crew subsequently ditched the airplane in the Hudson River, adjacent to the Intrepid Sea, Air, and Space Museum, in New York City.

The 150 passengers and 5 crewmembers evacuated the aircraft and were rescued by local ferry operators and boaters in the immediate area. One flight attendant and three passengers suffered serious injuries during the touchdown. Examinations of log entries revealed that the ferry *Thomas Jefferson* arrived at the airplane 3 minutes after the ditching occurred, the ferry *Thomas Kean* arrived 2 minutes later, the ferry *Moira Smith* arrived 1 minute after the *Thomas Kean*, and the ferry *Athena* arrived 1 minute later. The logs indicate that by 4:20 p.m., all passengers and crewmembers were off the airplane.

During and following the evacuation, the aircraft drifted downriver at a speed of about 1.6 miles per hour. During the rescue operations, the airplane was lashed to tugboats and fireboats to keep it afloat. The river current drove the airplane and boats toward the Manhattan shoreline and a tug then pushed the airplane to the Battery Park shore where it was then tied to a pier near the World Financial Center in lower Manhattan, about 3.5 miles from the touchdown point. In the days following the accident, the aircraft, minus the left engine, which had been knocked off during impact with the water, was lifted onto a barge and transported to a docking location on the New Jersey side of the river. There, the wings, horizontal stabilizer, vertical stabilizer, and right engine were removed. The left engine was recovered from the river 3 days later. The engines were transported directly from the dock in New Jersey to the General Electric facility in Cincinnati, Ohio, for investigative teardown. The rest of the wreckage is in a storage yard in Kearny, New Jersey, where it will remain for further study.

Interviews with the flight crew revealed that the initial takeoff was completely normal until the first officer spotted a group of dark birds slightly to the right of the flightpath. In his statements to Safety Board investigators, the captain stated that he saw the birds an instant later and said that the flock "filled his windscreen." He indicated that he had no time to react before he felt and heard the birds colliding with the airframe. He also described a feeling of an immediate and dramatic loss of thrust at the same time. He stated that he immediately took control of the airplane from the first officer and transmitted a mayday call to the departure air traffic controller. He then described directing the first officer to begin emergency procedures for dual engine failure. Due to the low altitude and the inability to maintain level flight, the captain said he concluded that a ditching in the river was the safest alternative available. He then made a single "brace for impact" call on the public address system, and shortly thereafter touched down in the water. He said that the wings were level at impact and that the airplane stopped suddenly.

The flight recorders were recovered from the aircraft intact and in good working order. The flight data recorder, or FDR, revealed that the elapsed time from takeoff to the birdstrikes was a little over 1.5 minutes. The time from the birdstrikes to touchdown in the water was about 3.5 minutes. The birds struck the aircraft at an altitude of about 2,750 feet.

Interviews with the three flight attendants revealed that the overall evacuation was orderly. In general, they stated that they heard a thud or thuds and then the airplane became very quiet. One noticed that the airplane was descending. When they heard the captain call "brace for impact" they began to shout, "brace, brace, heads down, stay down." One forward flight attendant described the touchdown as very firm, and the aft flight attendant described the touchdown as violent. None of them realized that the airplane was in the water until they looked out the windows.

Several problems complicated the evacuation effort. Cargo compartment structure had been pushed up through the floor of the rear of the airplane that resulted in an injury to the aft flight attendant. The aft pressure bulkhead of the fuselage was also compromised and water began to enter the rear cabin area. This water caused the fuselage to float tail down, and precluded the use of the two aft slide rafts. In addition, one passenger opened one of the rear doors, and the aft flight attendant could not completely reclose the door during the evacuation.

The FDR revealed no anomalies in the operation of the two General Electric/CFM56 engines during the accident flight up until the time the birds were ingested. The engines were disassembled at the General Electric factory in Cincinnati, Ohio. Canada Goose remains, including feathers, were found in both engines. We could not determine the number of birds ingested. The U.S. Department of Agriculture and the Smithsonian Institution assisted the Safety Board in these matters. Both engines show soft body damage on compressor blades and some of the compressor blades are bent. This bending was due to bird impact or impact with the water. Two days before the accident, one engine experienced a compressor stall in flight. Subsequent maintenance

on that engine before the accident flight included the replacement of a temperature probe in accordance with approved procedures. Maintenance tests following this replacement revealed no anomalies, and investigators have found no evidence to indicate that this earlier compressor stall was related to the accident 2 days later. In addition, an examination of engine maintenance records revealed that the engines on the airplane complied with all FAA airworthiness directives and manufacturer advisory bulletins in effect at the time.

An examination of the structure of the aircraft following the accident revealed severe damage to the underside of the rear fuselage, including the aforementioned compromised aft pressure bulkhead. Further documentation and measurement of the damage will occur soon. An examination of the aircraft systems revealed no anomalies associated with the flight controls. The auxiliary power unit, located in the rear fuselage was hanging from the rear of the airplane by its generator cables. The ram air turbine was found in its extended position. The auxiliary power unit was started by the captain after the thrust loss to supply electrical and hydraulic power, and operated as anticipated. The ram air turbine, designed to deploy automatically upon loss of critical electrical and/or hydraulic components, operated as designed. An examination of the interior of the cabin revealed deployed oxygen masks over 8 rows of seats behind row 14, and windows missing or loose in 6 rows aft of row 19.

Passenger turbine-powered airliner ditchings are quite rare but not unprecedented. For instance, in 1963, a Soviet civilian Tupolev-124 airliner ditched in the Neva River near Leningrad with no injuries or fatalities. In 1970, an Overseas National Airways, Inc. (ONA) DC-9 ditched approximately 30 miles east-northeast of St. Croix, Virgin Islands, with 63 persons on board. Forty of those, including 5 crew members, survived. And in 2002, an Indonesian Boeing 737 ditched in a shallow river near Yogyakarta, Indonesia, causing 13 serious injuries and one fatality. During the Hudson River accident, 4 persons were seriously injured, and of course, no fatalities occurred.

Dual jet engine malfunctions in general and dual engine malfunctions caused by ingestion of birds in particular are extremely rare events. Multiple jet engine failures can occur because of fuel exhaustion, rain ingestion, fuel icing, volcanic ash ingestion, and bird ingestion. Most often, bird ingestion causes no loss of thrust or a partial power loss. Even in the case of US Airways flight 1549, which did lose thrust in the right engine, the left engine did not fail completely. However, the thrust available from that engine was insufficient to allow the airplane to remain airborne.

The Safety Board is currently investigating, or assisting in the investigation, of three accidents where birdstrikes may have occurred. Most recently, a Sikorsky S-76 helicopter was likely struck by a bird and crashed near Morgan City, Louisiana, on January 4, 2009. Both pilots and six of the seven passengers on board were killed in that accident, and one person was critically injured. The Board is assisting the government of Italy in its investigation of a Ryanair Limited B-737-800 that crashed near Ciampino, Italy, on November 10, 2008, with no fatalities or injuries. And last, we are investigating

the loss of a Cessna 500 Citation that struck birds near Oklahoma City, Oklahoma, on March 4, 2008, resulting in 5 fatalities.

Since 1973, the Safety Board has issued 32 recommendations to the FAA and other agencies regarding birdstrikes, bird ingestion by aircraft engines, and bird hazard mitigation. The most recent of these recommendations were issued by the Board in 1999. (See attachment.)

The Safety Board has voted to hold a public hearing on the Hudson River accident. The hearing, which will likely be held in late spring of this year, will include the following topic areas:

1. **Turbine engine bird ingestion capability**. The GE/CFM56 engines on the Airbus A320 airplanes were certified by the European Joint Airworthiness Authority (JAA) and, subsequently, by the U.S. Federal Aviation Administration (FAA) under a bilateral agreement. The engines were originally certified to withstand the ingestion of seven 1-1/2 pound birds directed at the core of the engine. General Electric actually tested the engine using three 2-1/2 pound birds aimed at the core, which exceeded the requirements at the time. Today's test standard for the CFM56-5 is one 2-1/2 pound bird followed by five 1-1/2 pound birds, with a maximum allowable 25% loss of thrust. The fact that the accident engines exceeded even today's standard and still failed, is of great interest and concern to the Safety Board. On November 16, 2007, the FAA amended this certification standard by raising the weight of the bird to 8 pounds for engines manufactured in the future. In its September 2006 response to the FAA notice of proposed rulemaking (NPRM) that preceded this rule change, the Safety Board commented that the FAA's proposed bird weight was too low. We did not specify a minimum weight, but we did note that the weight should be increased to represent birds as large as the Canada Goose, which can weigh up to 24 pounds, thereby representing a more realistic threat to airplanes.

2. **The joint JAA/FAA certification of the Airbus A320 regarding water landings**. As noted previously, during the US Airways accident sequence, cargo bay structure was forced up through the cabin floor, seriously injuring a flight attendant. According to 14 CFR Part 25.801, practical design measures must be taken to minimize the probability of this happening. Also, the aft pressure bulkhead of the airplane was breached during impact, allowing water to enter the cabin and causing a tail-low water attitude. This precluded the use of the two aft slide rafts during the evacuation of the cabin. Part 25.801 states that following a ditching, the trim of the airplane should allow passengers the opportunity to use the rafts.

3. **The effectiveness of bird mitigation efforts at or near airports**. According to Embry-Riddle Aeronautical University statistics, birdstrikes cost the U.S. economy over $300 million, and have caused loss of life in the past. In 2007, a total of 7,439 birdstrikes were reported to the FAA. This number equates to 1.751 birdstrikes per 10,000 aircraft movements. Natural habitat surrounds many modern airports, and this habitat provides shelter, nesting areas, and feeding areas for wildlife that are not usually present in the

surrounding metropolitan area. Further, because bird flight typically occurs at low altitude, a majority of wildlife strikes occur within the immediate airport environment. The Board is interested in exploring the new technologies that are being developed and fielded to detect large groups of birds in these environments.

4. **The current state of training at U.S. airlines regarding a ditching scenario.** The highly experienced US Airways flight and cabin crews performed their duties in admirable fashion. The Board will explore the amount and type of training these personnel received and will consider what aspects of their training and experience influenced their decision-making and actions during the emergency. And, I might add that the air traffic controllers involved in the event performed their duties in an admirable manner under trying and busy conditions.

Mr. Chairman, this concludes my testimony, and I will be glad to answer questions at the appropriate time.

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

Log Number 2764

Issue Date 11/19/1999 KANSAS CITY MO 3/4/1999

ON 3/4/99, AT 2200 CENTRAL STANDARD TIME, A DOUGLAS DC-9-15F, N195US, OPERATED BY USA JET AIRLINES, INC., ENCOUNTERED A FLOCK OF LARGE BIRDS WHILE ON FINAL APPROACH FOR LANDING AT KANSAS CITY INT'L. AIRPORT, KANSAS CITY, MISSOURI. DURING THE ENCOUNTER, SEVERAL BIRDS WERE INGESTED INTO BOTH ENGINES, RESULTING IN SEVERE ENGINE POWER LOSS. THE PILOT REGAINED ENOUGH POWER IN ONE ENGINE TO CONTINUE THE APPROACH AND LAND THE AIRPLANE WITHOUT FUTHER INCIDENT. THERE WERE NO INJURIES. NIGHT VISUAL METEOROLOGICAL CONDITIONS PREVAILED AT THE TIME OF THE ENCOUNTER, AND AN INSTRUMENT FLIGHT RULES (IFR) FLIGHT PLAN HAD BEEN FILED FOR THE NONSCHEDULED DOMESTIC AIR CARGO FLIGHT. THE FLIGHT WAS CONDUCTED UNDER THE PROVISIONS OF 14 CODE OF FEDERAL REGULATIONS (CFR) PART 121.

Recommendation # A-99-086

Overall Status
CAA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: EVALUATE THE POTENTIAL FOR USING AVIAN HAZARD ADVISORY SYSTEM TECHNOLOGY FOR BIRD STRIKE RISK REDUCTION IN CIVIL AVIATION AND IF FOUND FEASIBLE, IMPLEMENT SUCH A SYSTEM IN HIGH-RISK AREAS, SUCH AS MAJOR HUB AIRPORTS AND ALONG MIGRATORY BIRD ROUTES, NATIONWIDE.

FAA	Closed - Acceptable Action	5/11/2000

2/14/2000 Addressee — Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA AGREES WITH THE INTENT OF THIS RECOMMENDATION AND HAS ALLOCATED RESEARCH FUNDS IN FISCAL YEAR (FY) 1999 TO BEGIN STUDYING THE USE OF AVIAN HAZARD ADVISORY SYSTEM (AHAS) TECHNOLOGY FOR THE MONITORING OF BIRD MOVEMENTS ON A NATIONAL BASIS. THE AHAS IS WELL SUITED FOR MONITORING BIRD MOVEMENTS ON A REGIONAL BASIS. HOWEVER, BECAUSE OF LIMITATIONS INHERENT IN THE AHAS, IT IS NOT SUITABLE FOR MONITORING BIRD MOVEMENTS ON OR WITHIN 5 MILES OF AN AIRPORT. TO MONITOR BIRD MOVEMENTS WITHIN 5 MILES OF AN AIRPORT, A DIFFERENT TYPE OF RADAR MUST BE USED. THE FAA IS WORKING WITH THE U.S. AIR FORCE BIRD AIRCRAFT STRIKE HAZARD TEAM AND GIO-MARINE TO STUDY THE USE OF AHAS TECHNOLOGY FOR MONITORING BIRD MOVEMENT ON A REGIONAL BASIS AND RESEARCH THE USE OF MICRO-BURST PREDICTION RADAR FOR MONITORING BIRD MOVEMENT WITHIN 5 MILES OF AN AIRPORT. THE FAA WILL CONDUCT A DETAILED REVIEW DURING FY 2000 OF ALL COMPONENTS THAT MAKE UP AHAS. THE REVIEW WILL INCLUDE: (1) ACQUISITION OF NEXRAD RADAR DATA, (2) ACQUISITION OF WEATHER DATA AND OF PREDICTED WEATHER OVER THE NEXT 24 HOURS (THIS EFFORT IS PROVIDED BY THE NATIONAL WEATHER SERVICE). THE PREDICTION USES THE MOS PROGRAM FROM NWS, (3) PROCESSING OF WEATHER DATA AGAINST KNOWN MIGRATORY BIRD "RULES", (4) DEVELOPMENT AND USE OF A NEURAL NETWORK TO PREDICT BIRD MOVEMENT AT THE NATIONAL LEVEL, AND (5) RISK ASSESSMENT FOR HIGH SPEED, LOW-LEVEL FLYING--THE FAA IS DEVELOPING RISK ASSESSMENT FACTORS FOR CIVIL AIRPORTS. BASED ON THE RESULTS OF THE DETAILED REVIEW, THE FAA WILL DETERMINE HOW AHAS CAN BE MODIFIED/ADAPTED FOR USE IN COMMERCIAL AVIATION. THE FAA WILL REVIEW OTHER TECHNOLOGIES AND RADAR SYSTEMS THAT CAN BE USED OR MODIFIED FOR USE AT THE LOCAL LEVEL. THIS WOULD PROVIDE AN AIRPORT COVERAGE FOR DETECTING WILDLIFE IN REAL TIME. TWO DIFFERENT TYPES OF RADAR THAT MAY BE ABLE TO PROVIDE THE NEEDED COVERAGE ARE THE ASR-9 OR THE AMPER RADAR (PREVIOUSLY KNOWN AS THE MICRO-BURST RADAR). A PROTOTYPE OF THE AMPER RADAR SYSTEM IS SCHEDULED TO BE INSTALLED AT PANAMA CITY IN EARLY 2000.

5/11/2000 NTSB — THE SAFETY BOARD HAS REVIEWED THE FAA'S ACTIONS AND APPRECIATES THAT THE EVALUATION ADDRESSES THE POTENTIAL USE OF PREDICTION RADAR IN AREAS WHERE THE AHAS IS NOT EFFECTIVE. BECAUSE THE FAA'S EVALUATION OF AHAS FOUND THAT IT IS NOT EFFECTIVE IN HIGH-RISK AREAS AND THE FAA CONTINUES TO RESEARCH OTHER FORMS OF RADAR OF RADAR FOR THOSE AREAS, A-99-86 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

Recommendation # A-99-087

Overall Status
CAA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: IN COORDINATION WITH THE U.S. DEPT. OF AGRICULTURE, CONDUCT RESEARCH TO DETERMINE THE EFFECTIVENESS AND LIMITATIONS OF EXISTING AND POTENTIAL BIRD HAZARD REDUCTION TECHNOLOGIES.

FAA	Closed - Acceptable Action	5/11/2000

2/14/2000 Addressee

Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA AGREES WITH THIS RECOMMENDATION AND IN 1991 ENTERED INTO AN INTERAGENCY AGREEMENT WITH THE U.S. DEPT. OF AGRICULTURE'S (USDA) WILDLIFE SERVICES, NATIONAL WILDLIFE RESEARCH CENTER TO CONDUCT RESEARCH FOR REDUCING THE WILDLIFE AIRCRAFT STRIKE RATE. ON 1/25/99, A NEW 5-YEAR INTERAGENCY AGREEMENT WAS SIGNED. UNDER THE TERMS OF THE INTERAGENCY AGREEMENT, THE FOLLOWING GENERAL AREAS OF RESEARCH ARE BEING ADDRESSED: *A MANUAL ENTITLED "WILDLIFE HAZARD MANAGEMENT AT AIRPORTS" WAS DEVELOPED BY THE FAA AND THE USDA'S WILDLIFE SERVICES, NATIONAL WILDLIFE RESEARCH CENTER. THE MANUAL DISCUSSES WILDLIFE CONTROL METHODS AND WILL BE DISTRIBUTED TO ALL 14 CFR PART 139 AIRPORTS, USDA WILDLIFE SERVICES' STATE DIRECTORS, AND INDUSTRY ORGANIZATIONS. *CONDUCT HABITAT STUDIES AT VARIOUS AIRPORTS OR AT OTHER SITES THAT SIMULATE AIRPORT ENVIRONMENTS AND THAT ARE UNITED STATES. AIRPORT WILDLIFE HABITAT STUDIES HAVE BEEN CONDUCTED AT JOHN F. KENNEDY INT'L. AIRPORT, CHICAGO O'HARE INT'L. AIRPORT, AND ATLANTIC CITY INT'L. AIRPORT. CURRENTLY, STUDIES ARE BEING INITIATED AT SIX AIRPORTS IN THE NORTHWEST. THESE STUDIES PROVIDE THE SCIENTIFIC BASIS FOR AIRPORT WILDLIFE HABITAT MANAGEMENT DESIGNED TO MINIMIZE WILDLIFE ATTRACTANTS AND THE WILDLIFE STRIKE HAZARD AT AIRPORTS. LANDFILL STUDIES HAVE BEEN CONDUCTED AT VARIOUS TYPES OF LANDFILLS (MUNICIPAL SOLID WAST, CONSTRUCTION AND DEMOLITION DEBRIS, COMPOSTING REPRESENTATIVE OF THE MAJOR REGIONAL AIRPORT HABITATS IN THE FACILITIES, AND TRASH TRANSFER STATIONS). THE INFORMATION GAINED PROVIDED THE SCIENTIFIC BASIS FOR THE RECOMMENDATIONS MADE IN ADVISORY CIRCULAR 150/5200-33, WILDLIFE HAZARDS ON OR NEAR AIRPORTS. EVALUATE THE EFFICACY OF VARIOUS WILDLIFE CONTROL METHODS AND HELP DEVELOP NEW METHODS. ABOUT 30 VARIOUS TOOLS, CHEMICALS, AND TECHNIQUES HAVE BEEN EVALUATED. THIS EFFORT HAS LED TO THE ENVIRONMENTAL PROTECTION AGENCY'S REGISTRATION OF AT LEAST ONE NEW BIRD REPELLANT AND THE FEDERAL DRUG ADMINISTRATION'S APPROVAL OF ONE NEW BIRD-CAPTURING DRUG. THE FAA WILL COMPLETE THE INFORMATION GAINED FROM THE RESEARCH EFFORTS AND THE INFORMATION THAT ALREADY EXISTS IN BOTH SCIENTIFIC AND POPULAR LITERATURE INTO A CONCISE AND USEABLE DOCUMENT. OVER 120 MANUSCRIPTS HAVE BEEN PUBLISHED AND OVER 200 PRESENTATIONS HAVE BEEN MADE TO VARIOUS SPECIAL INTEREST OR USER GROUPS THAT PRESENT INFORMATION LEARNED AS A RESULT OF THE RESEARCH. * A POSTER AIMED AT INCREASING PILOT AWARENESS ABOUT WILDLIFE AIRCRAFT STRIKE HAZARDS WAS DEVELOPED AND DISTRIBUTED TO ALL CERTIFICATED AIRPORTS, ALL ATTENDEES AT THE 1997 BIRD STRIKE COMMITTEE USA MEETING, AND ALL NATIONAL BUSINESS AIRCRAFT ASSOCIATION AND AMERICAN ASSOCIATION OF AIRPORT EXECUTIVES MEMBERS. *MAINTAIN AND MANAGE THE FAA'S NATIONAL WILDLIFE STRIKE DATA BASE. THERE ARE CURRENTLY OVER 26,000 INDIVIDUAL RECORDS IN THE DATA BASE. THE DATA BASE PROVIDES ESSENTIAL BASELINE INFORMATION ON THE NATURE AND EXTENT OF THE WILDLIFE HAZARD PROBLEM. THE DATA BASE HAS BEEN USED BY NUMEROUS ORGANIZATIONS, BOTH PUBLIC AND PRIVATE, TO GAIN A BETTER UNDERSTANDING OF THE WILDLIFE AIRCRAFT STRIKE PROBLEM AND DIRECT AND FOCUS RESEARCH EFFORTS. BEGINNING IN 1995, THE FAA AND THE USDA'S WILDLIFE SERVICES PREPARED AND PUBLISHED ANNUAL REPORTS ON WILDLIFE STRIKES TO CIVIL AIRCRAFT IN THE UNITED STATES. THE FIRST REPORT COVERING 1994 WAS COMPLETED IN NOVEMBER 1995. SUBSEQUENT REPORTS COVERING THE YEARS 1993-1995, 1992-1996, 1991-1997, AND 1990-1998, WERE ISSUED IN 1996, 1997, 1998, AND 1999, RESPECTIVELY. THE FAA PLANS TO PUBLISH A DETAILED REPORT COVERING 1990-1999. SUBSEQUENT DETAILED REPORTS WILL BE PRODUCED AT 5-YEAR INTERVALS. IN THE INTERIM YEARS, ANNUAL REPORTS SUMMARIZING DATA IN TABULAR AND GRAPHIC FORM FOR ALL AVAILABLE YEARS WILL BE PRODUCED.

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

5/11/2000 NTSB — THE SAFETY BOARD APPRECIATES THE FAA'S ACTIONS TO REDUCE THE BIRD STRIKE RATE OF AIRCRAFT. THESE ACTIONS, IN CONJUNCTION WITH THOSE OF THE USDA, MAY POTENTIALLY IMPROVE AVIATION SAFETY THROUGHOUT THE COUNTRY. BECAUSE THE FAA REPORTS THAT IT WILL CONTINUE TO WORK ON CURRENT AND FUTURE BIRD HAZARD REDUCTION TECHNOLOGIES AND HAS SIGNED A 5-YEAR AGREEMENT WITH THE USDA IN SUPPORT OF THAT ACTION, A-99-87 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation # A-99-088

Overall Status CUA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: IN CONSULTATION WITH THE U.S. DEPT. OF AGRICULTURE, REQUIRE THAT WILDLIFE ASSESSMENTS BE CONDUCTED AT ALL 14 CODE OF FEDERAL REGULATIONS PART 139 AIRPORTS WHERE SUCH ASSESSMENTS HAVE NOT ALREADY BEEN CONDUCTED.

FAA	Closed - Unacceptable Action	5/11/2000

2/14/2000 Addressee — Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA DOES NOT BELIEVE IT IS NECESSARY TO INITIATE ADDITIONAL REGULATIONS TO REQUIRE ALL 14 CFR PART 139 AIRPORTS TO CONDUCT WILDLIFE ASSESSMENTS. 14 CFR 139.337(A) REQUIRES THAT EACH CERTIFICATE HOLDER PROVIDE AN ECOLOGICAL STUDY WHEN ANY OF THE FOLLOWING EVENTS OCCUR ON OR NEAR AN AIRPORT: AN AIR CARRIER AIRCRAFT EXPERIENCES A MULTIPLE BIRD STRIKE OR ENGINE INGESTION, AN AIR CARRIER AIRCRAFT EXPERIENCES A DAMAGING COLLISION WITH WILDLIFE OTHER THAN BIRDS, OR WILDLIFE OF A SIZE OR IN NUMBERS CAPABLE OF CAUSING AN EVENT DESCRIBED IS OBSERVED TO HAVE ACCESS TO ANY AIRPORT FLIGHT PATTERN OR MOVEMENT AREA. TO REQUIRE ALL 14 CFR APRT 139 AIRPORTS TO CONDUCT A WILDLIFE HAZARD ASSESSMENT WITHOUT ONE OF THE TRIGGER EVENTS CURRENTLY REQUIRED WOULD PLACE AN UNDUE BURDEN ON MANY AIRPORTS THAT DO NOT HAVE A HISTORY OF WILDLIFE STRIKES. THE BOARD HAS ISSUED EIGHT SAFETY RECOMMENDATIONS TO THE FAA THAT ADDRESS BIRD STRIKE HAZARDS. I BELIEVE THAT ALL OF THE ACTIONS OUTLINED IN THIS LETTER WILL ADDRESS THIS SAFETY ISSUE WITHOUT HAVING TO IMPLEMENT ADDITIONAL REGULATORY ACTIONS. I ASK THAT THE BOARD EVALUATE ALL OF THE OTHER ACTIONS OUTLINED IN THIS LETTER AS THEY RELATE TO ADDRESSING THE SAFETY CONCERN WHEN CLASSIFYING THIS SAFETY RECOMMENDATION. I CONSIDER THE FAA'S ACTION TO BE COMPLETED ON THIS RECOMMENDATION, AND I PLAN NO FURTHER ACTION.

5/11/2000 NTSB — ALTHOUGH THE SAFETY BOARD UNDERSTANDS THE POTENTIAL FISCAL BURDEN ON AIRPORTS, THE BOARD STRONGLY FEELS THAT THIS EFFORT IS NECESSARY TO ENSURE THAT ALL AIRPORTS BECOME AWARE OF THE POTENTIAL HAZARDS OF WILDLIFE STRIKES, REGARDLESS OF THEIR LOCATION. BECAUSE THE FAA STATES THAT IT DOES NOT AGREE WITH THE BOARD, AND WILL NOT REQUIRE WILDLIFE ASSESSMENTS AT ALL AIRPORTS, A-99-88 IS CLASSIFIED "CLOSED--UNACCEPTABLE ACTION."

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

Recommendation # A-99-089

Overall Status
CUA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REQUIRE THE DEVELOPMENT OF A WILDLIFE HAZARD MANAGEMENT PROGRAM FOR ALL AIRPORTS DETERMINED TO NEED ONE AS A RESULT OF THE WILDLIFE HAZARD ASSESSMENT PROPOSED IN RECOMMENDATION A-99-88.

FAA	Closed - Unacceptable Action	5/11/2000

2/14/2000	Addressee	Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA AGREES WITH THE INTENT OF THIS RECOMMENDATION AND BELIEVES THAT EXISTING REGULATIONS SPECIFICALLY ADDRESS THIS ISSUE. 14 CFR 139.337(A) ESTABLISHES THE REQUIREMENT FOR ECOLOGICAL STUDIES. FOR THOSE CERTIFICATE HOLDERS REQUIRED TO PROVIDE WILDLIFE HAZARD ASSESSMENTS UNDER CURRENT REGULATIONS, THE FORMULATION OF A WILDLIFE HAZARD MANAGEMENT PLAN IS ADEQUATELY ADDRESSED. 14 CFR 139337(C) REQUIRES THAT THE FAA REVIEW EVERY WILDLIFE HAZARD ASSESSMENT (ECOLOGICAL STUDY) TO DETERMINE IF A WILDLIFE HAZARD MANAGEMENT PLAN IS NEEDED. IF IT IS DETERMINED THAT A WILDLIFE HAZARD MANAGEMENT PLAN IS NEEDED, 14 CFR 139.337(D) REQUIRES THAT THE CERTIFICATE HOLDER FORMULATE AND IMPLEMENT A PLAN USING THE WILDLIFE HAZARD ASSESSMENT (ECOLOGICAL STUDY) AS A BASIS. I BELIEVE THAT ALL OF THE ACTIONS OUTLINED IN THIS LETTER WILL ADDRESS THIS SAFETY ISSUE WITHOUT HAVING TO IMPLEMENT ADDITIONAL REGULATORY ACTIONS. I ASK THAT THE BOARD EVALUATE ALL OF THE OTHER ACTIONS OUTLINED IN THIS LETTER AS THEY RELATE TO ADDRESSING THE SAFETY CONCERN WHEN CLASSIFYING THIS RECOMMEMDATION. I CONSIDER THE FAA'S ACTION TO BE COMPLETED ON THIS RECOMMENDATION, AND I PLAN NO FURTHER ACTION.
5/11/2000	NTSB	ALTHOUGH THE SAFETY BOARD UNDERSTANDS THE POTENTIAL FISCAL BURDEN ON AIRPORTS, THE BOARD STRONGLY FEELS THAT THIS EFFORT IS NECESSARY TO ENSURE THAT ALL AIRPORTS BECOME AWARE OF THE POTENTIAL HAZARDS OF WILDLIFE STRIKES, REGARDLESS OF THEIR LOCATION. BECAUSE SATISFACTORY COMPLETION OF A-99-89 RELIES ON ACCEPTABLE ACTION IN RESPONSE TO A-99-88, A-99-89 IS CLASSIFIED "CLOSED--UNACCEPTABLE ACTION."

Recommendation # A-99-090

Overall Status
CAA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: ENSURE THAT THE WILDLIFE HAZARD MANAGEMENT PROGRAMS ARE INCORPORATED INTO THE AIRPORT CERTIFICATION MANUALS AND PERIODICALLY INSPECT THE PROGRAMS' PROGRESS.

FAA	Closed - Acceptable Action	5/11/2000

2/14/2000	Addressee	Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA BELIEVES THAT EXISTING REGULATIONS AND DEPARTMENTAL POLICIES MEET THE INTENT OF THIS RECOMMENDATION. 14 CFR 139.205(B)(23) REQUIRES THAT ALL CERTIFICATE HOLDERS SERVING REGULARLY SCHEDULED AIR CARRIER OPERATIONS WITH MORE THAN 30 SEATS INCORPORATE AN FAA-APPROVED WILDLIFE HAZARD MANAGEMENT PLAN INTO THEIR AIRPORT CERTIFICATION MANUAL. ON 10/4/99, THE FAA'S OFFICE OF AIRPORT SAFETY AND STANDARDS ISSUED PROGRAM AND POLICY GUIDANCE--POLICY #64, "REVIEW OF AIRPORT WILDLIFE HAZARD MANAGEMENT PLANS," TO PROVIDE GUIDANCE AND CLARIFICATION ON INTERPRETATION OF THE REGULATORY REQUIREMENTS AND PROVIDE BACKGROUND ON THE MEANING OF THE RELEVANT REGULATIONS. THE POLICY GUIDANCE ESTABLISHED PROCEDURES THAT AIRPORT CERTIFICATION SAFETY INSPECTORS MUST FOLLOW WHEN AN ACCIDENT OCCURS THAT REQUIRES AN OPERATOR OF A CERTIFICATED AIRPORT TO INITIATE A WILDLIFE HAZARD ASSESSMENT (ECOLOGICAL STUDY). THE POLICY GUIDANCE ALSO REQUIRES THAT AIRPORT CERTIFICATION SAFETY INSPECTORS, AS PART OF THE INITIAL OR PERIODIC INSPECTION, REVIEW AN AIRPORT'S WILDLIFE HAZARD MANAGEMENT PLAN TO ENSURE THAT IT MEETS ALL REQUIREMENTS OF 14 CFR 139.337(E). I HAVE ENCLOSED A COPY OF THE POLICY GUIDANCE FOR THE BOARD'S INFORMATION. I BELIEVE THAT THE FAA HAS ADDRESSED THE FULL INTENT OF THIS RECOMMENDATION, AND I CONSIDER THE FAA'S ACTION TO BE COMPLETED.

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

5/11/2000 NTSB THE SAFETY BOARD HAS REVIEWED THE CURRENT AIRPORT CERTIFICATION MANUALS AND NOTES THAT WILDLIFE HAZARD MANAGEMENT IS INCORPORATED AND THAT THERE IS A REQUIREMENT FOR SAFETY INSPECTORS TO ASSESS THE PLAN TO ENSURE THAT IT MEETS ALL REQUIREMENTS OF CURRENT FEDERAL AVIATION REGULATIONS. ON THE BASIS OF THAT REVIEW, A-99-90 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation # A-99-091

Overall Status CUA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REQUIRE ALL AIRPLANE OPERATORS TO REPORT BIRD STRIKES TO THE FEDERAL AVIATION ADMINISTRATION.

FAA	Closed - Unacceptable Action	5/11/2000

2/14/2000 Addressee Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA HAS DEVOTED CHAPTER 7, SECTION 4, OF THE AERONAUTICAL INFORMATION MANUAL (AIM) TO BIRD HAZARDS. THIS SECTION INCLUDES REPORTING BIRD STRIKES, REDUCING BIRD STRIKE RISKS, AND MIGRATORY BIRD ACTIVITY. IN ACCORDANCE WITH THE LONGSTANDING GUIDANCE OUTLINED IN SECTION 4 OF THE AIM, PILOTS REPORT BIRD OR OTHER WILDLIFE STRIKES USING FAA FORM 5200-7. THE DATA DERIVED FROM THESE REPORTS ARE USED TO DEVELOP STANDARDS TO COPE WITH THIS POTENTIAL HAZARD TO AIRCRAFT AND FOR DOCUMENTATION OF NECESSARY HABITAT CONTROL ON AIRPORTS. THE FAA BELIEVES THAT SUFFICIENT REPORTING PROCEDURES ARE PROVIDED TO OBTAIN ADEQUATE TREND ANALYSIS DATA FOR AREAS OF HIGH BIRD STRIKE ACTIVITY. A REGULATORY REQUIREMENT TO MANDATE THE REPORTING OF BIRD STRIKES WOULD NOT RESOLVE THE BASIC PROBLEM OF BIRD ACTIVITY AND AIRCRAFT. THE FAA BELIEVES THAT BETTER DESIGN AND PLANNING OF AIRPORT LOCATIONS AND THE ON-AIRPORT CONTROL OF BIRD HAZARDS ARE THE KEYS TO THE REDUCTION OF THE BIRD HAZARD PROBLEM. AS A PRACTICAL MATTER, THE PROPOSED REGULATION WOULD BE DIFFUCULT TO ENFORCE, AND IT WOULD BE UNCLEAR WHAT SORT OF SANCTION WOULD BE APPROPRIATE IF A PILOT FAILED TO REPORT A BIRD STRIKE. ADDITIONALLY, 14 CFR PART 121 AIR CARRIERS ARE CURRENTLY REQUIRED TO REPORT THE OCCURRENCE OR FAILURE OF ANY ENGINE SHUTDOWN DURING FLIGHT BECAUSE OF FOREIGN OBJECT INGESTION, INCLUDING A BIRD STRIKE, OR ANY CRACKS OR PERMANENT DEFORMATION OF AIRCRAFT STRUCTURES. I BELIEVE THAT ALL OF THE ACTIONS OUTLINED IN THIS LETTER WILL ADDRESS THIS SAFETY ISSUE WITHOUT HAVING TO IMPLEMENT ADDITIONAL REGULATORY ACTIONS. I ASK THAT THE BOARD EVALUATE ALL OF THE OTHER ACTIONS OUTLINED IN THIS LETTER AS THEY RELATE TO ADDRESSING THE SAFETY CONCERN WHEN CLASSIFYING THIS SAFETY RECOMMENDATION. I CONSIDER THE FAA'S ACTION TO BE COMPLETED, AND I PLAN NO FURTHER ACTION.

5/11/2000 NTSB THE SAFETY BOARD APPRECIATES THE POTENTIAL DIFFICULTY IN DEVELOPING THIS REGULATION. HOWEVER, THE IMPORTANCE OF ESTABLISHING A SOLID DATABASE OF BIRD STRIKES AND USING DATA TO DETERMINE TRENDS AND FORECAST POTENTIAL HAZARDS CANNOT BE UNDERSTATED. ALTHOUGH MANY OF THE BIRD STRIKE PREVENTION MEASURES THE FAA IS TAKING ARE PROMISING, THE BOARD IS DISAPPOINTED WITH THE FAA'S FAILURE TO ADOPT THIS MEASURE. BECAUSE THE FAA HAS STATED IT WILL NOT REQUIRE ALL PILOTS TO REPORT BIRD STRIKES, THE SAFETY BOARD CLASSIFIES A-99-91 "CLOSED--UNACCEPTABLE ACTION."

Recommendation # A-99-092

Overall Status CAA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: CONTRACT WITH AN APPROPRIATE AGENCY TO PROVIDE PROPER IDENTIFICATION OF BIRD REMAINS, ESTABLISH TIMELY PROCEDURES FOR PROPER BIRD SPECIES IDENTIFICATION, AND ENSURE THAT AIRPORT AND AIRCRAFT MAINTENANCE EMPLOYEES ARE FAMILIAR WITH THE PROCEDURES.

FAA	Closed - Acceptable Action	5/11/2000

2/14/2000 Addressee Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 AS PART OF THE CURRENT INTERAGENCY AGREEMENT WITH THE USDA'S WILDLIFE SERVICES' NATIONAL WILDLIFE RESEARCH CENTER, A CONTRACT HAS BEEN AWARDED TO THE SMITHSONIAN INSTITUTE TO ASSIST IN THE PREPARATION AND IDENTIFICATION OF BIRD STRIKE REMAINS. THE FAA HAS PROVIDED $90K IN FY 2000 TO FUND THIS CONTRACT. I BELIEVE THAT THE FAA HAS ADDRESSED THIS RECOMMENDATION, AND I CONSIDER THE FAA'S ACTION TO BE COMPLETED.

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

5/11/2000 NTSB ON THE BASIS OF THESE ACTIONS, A-99-92 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation # A-99-093

Overall Status CAA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: BEFORE ALLOWING HIGH-SPEED, LOW-LEVEL AIRPLANE OPERATIONS, EVALUATE THE POTENTIAL RISK OF INCREASED BIRD STRIKE HAZARDS TO AIR CARRIER TURBO-JET AIRPLANES.

FAA	Closed - Acceptable Action	10/31/2005

2/14/2000 Addressee Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA HAS INITIATED A PROJECT TO EVALUATE DEPARTURE SPEEDS GREATER THAN 250 KNOTS IN CLASS B AIRSPACE. PHASE I INCLUDES GATHERING DATA USING BOEING 747-400 AND BOEING 727 SIMULATORS. THE RESULTS OF PHASE I WILL BE PROVIDED TO THE FAA'S AIR TRAFFIC SERVICE FOR REVIEW AND A DETERMINATION AS TO WHETHER OR NOT TO PROCEED WITH PHASE II, WHICH IS A RISK ANALYSIS TO DETERMINE IF THE INCREASED SPEED WOULD IMPACT SAFETY. IF THE PROJECT ADVANCES TO PHASE II, THE FAA WILL INCLUDE AN EVALUATION OF BIRD STRIKE HAZARDS IN ITS RISK ANALYSIS. I WILL KEEP THE BOARD INFORMED OF THE FAA'S PROGRESS ON THIS RECOMMENDATION.

5/11/2000 NTSB THE SAFETY BOARD CONCURS WITH THE FAA'S DECISION TO CONDUCT A RISK ANALYSIS OF HIGH-SPEED, LOW-LEVEL OPERATIONS BY COMMERCIAL CARRIERS. IF PHASE II IS INITIATED, THE BOARD WOULD APPRECIATE A COPY OF THE FORMAL RISK ASSESSMENT THAT INCLUDES THE BIRD STRIKE HAZARD EVALUATION. PENDING THAT EVALUATION, A-99-93 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."

1/11/2001 Addressee Letter Mail Controlled 01/16/2001 7:13:16 PM MC# 2010034 The Federal Aviation Administration (FAA) initiated a project at Houston Intercontinental Airport to evaluate departure speeds greater than 250 knots in Class B airspace. Phase I included gathering data using Boeing 747-400 and Boeing 727 simulators. Phase I was completed in July 2000 and the findings were presented to industry at a special meeting held on October 20, 2000. Industry was comfortable with the results of Phase I, and it was agreed to continue with Phase II, which is the risk analysis. Industry has identified some issues and concerns that need to be addressed during the risk analysis, so a test plan will be developed to address these concerns. Bird strike hazards were included as one of the concerns to be addressed in the plan. It is anticipated that the risk assessment will be completed by the end of the third quarter of fiscal year 2001. I will provide the Board with a copy of the formal risk assessment that includes bird strike evaluation as soon as it is completed.

3/9/2001 NTSB The FAA reports that it initiated a project at Houston Intercontinental Airport to evaluate departure speeds greater than 250 knots in Class B airspace. The FAA indicates that Phase I, which included gathering data using Boeing 747-400 and Boeing 727 simulators, was completed in July 2000, and the findings were presented to industry at an October 20, 2000, meeting. The FAA reports that industry was comfortable with the results of Phase I, and it was agreed to continue with Phase II, which is the risk analysis. The FAA states that industry identified issues and concerns that need to be addressed during the risk analysis; therefore, the FAA will develop a test plan to address these concerns, which include bird strike hazards. Pending our receipt of a copy of the formal risk assessment that includes an evaluation of the hazard of bird strikes from high-speed, low-level aviation operations, Safety Recommendation A-99-93 remains classified "Open--Acceptable Response."

11/12/2002 Addressee Letter Mail Controlled 11/19/2002 9:28:58 AM MC# 2020958 The Federal Aviation Administration (FAA) is completing the risk assessment resulting from the evaluation of departure speeds greater than 250 knots in Class B airspace. It is anticipated that the risk assessment will be completed in December 2002. I will provide the Board with a copy of the risk assessment as soon as it is issued. The FAA is also sponsoring an additional study entitled "Assessment of Wildlife Strike Risk to Airframes." Representatives from the University of Illinois are focusing the study on the development of a risk assessment. The risk assessment will model one bird species (Canadian Goose) and one aircraft type (Boeing 737). The focus of the study will be between 3,000 to 4,000 feet above ground level. A draft report is expected by December 2002.
I will provide the Board with a copy of the formal risk assessment that includes bird strike evaluation as soon as it is completed.

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

2/25/2003	NTSB	The Board notes that the FAA is completing the risk assessment resulting from its evaluation of departure speeds greater than 250 knots in Class B airspace. We further note that the FAA is sponsoring a study titled "Assessment of Wildlife Strike Risk to Airframes" that will include the development of a risk assessment. The risk assessment will model one bird species (Canada goose) and one aircraft type (Boeing 737). The Safety Board appreciates receiving this update. Pending development and application of a procedure implementing (1) the risk assessment of increased bird strike hazards to airplanes with departure speeds greater than 250 knots in Class B airspace and (2) the findings of the "Assessment of Wildlife Strike Risk to Airframes" study, Safety Recommendation A-99-93 remains classified "Open--Acceptable Response."
5/5/2003	Addressee	Letter Mail Controlled 5/13/2003 11:01:19 AM MC# 2030239 In December 2002, the Federal Aviation Administration's (FAA) Transport Airplane Directorate, in conjunction with the William J. Hughes Technical Center and the University of Illinois, completed a study of the risks of structural damage posed by wildlife/aircraft collision. The risk analysis performed provided an initial result that has fully utilized existing strike database records and specifically considers the kinetic energy of the wildlife/aircraft collision. The risk analysis determined that relatively low kinetic energy impacts have relatively high probabilities of occurring, but usually result in collisions with low hazard ratings. Further, high kinetic energy impacts have a relatively low probability of occurring, but have a higher probability of resulting in collisions with high hazard ratings. The FAA is reviewing the report and the findings. I will keep the Board informed of the FAA's progress on this safety recommendation.
7/31/2003	NTSB	The Safety Board notes that the FAA completed a study of the risks of structural damage posed by wildlife/aircraft collisions, and that the risk analysis performed utilized the FAA's existing bird strike database and considered the kinetic energy of the wildlife/aircraft collision. In its November 19, 1999, letter that transmitted this recommendation to the FAA, the Safety Board concluded that because the majority of bird strikes occur at altitudes lower than 10,000 feet, increasing the exposure times of air carrier turbo-jet airplanes to that altitude range at higher speeds may markedly increase the risk of bird strikes to those airplanes. Although the Safety Board acknowledges that high-energy impacts represent a greater risk of structural damage than lower-energy impacts, the Board believes the FAA should minimize the risk of any bird strikes due to exposure time, regardless of the impact energy. The Board believes that any policy that permits an increased risk of bird strikes solely because the impacts are considered lower energy events would not be acceptable. The Safety Board appreciates receiving this update. Pending the development of a system that evaluates the potential risk of increased bird strike hazards, based on increased exposure times, before allowing high-speed, low-level airplane operations, Safety Recommendation A-99-93 remains classified "Open--Acceptable Response."
7/7/2005	Addressee	Letter Mail Controlled 7/19/2005 12:36:54 PM MC# 2050334 This is in further response to Safety Recommendation A-99-93 issued by the Board on November 19, 1999, and supplements our letters dated February 14, 2000, January 11, 2001, and November 12, 2002. This safety recommendation was issued as a result of the Board's investigation of two incidents involving bird strikes. On March 4, 1999, a Douglas DC-9-15F, operated by USA Jet Airlines, Inc., encountered a flock of large birds while on final approach at Kansas City International Airport, Kansas City, Missouri. During the encounter, several birds were ingested into both engines, resulting in severe engine power loss. The pilot regained enough power in one engine to continue the approach and land the airplane without further incident. There were no injuries. On February 22, 1999, a Boeing 757,operated by Delta Air Lines, penetrated a flock of birds during takeoff from Cincinnati/Northern Kentucky International Airport, Covington, Kentucky. According to the captain, the takeoff roll was normal until reaching approximately 150 knots, at which time a flock of birds traveled from left to right in front of the airplane. The captain alerted the first officer to the hazard and asked him to attempt to climb over the flock. The first officer complied by increasing the airplane's pitch angle. However, as the main landing gear lifted off the runway, the airplane penetrated the flock. The captain advised air traffic control of the event and was cleared to return to the airport and land. The captain observed no change in engine performance or flight characteristics during or after the event. There were no injuries, but the airplane was substantially damaged. A-99-03, Before allowing high-speed, low-level airplane operations, evaluate the potential risk of increased bird strike hazards to air carrier turbo-jet airplanes. FAA Comment. The Federal Aviation Administration is no longer considering allowing high-speed, low-level airplane operations to facilitate air traffic flow (over 250 knots, below 10,000 feet). If FAA does consider these operations in the future, it will evaluate the potential risk of increased bird strike hazards to these airplanes.

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

10/31/2005 NTSB

As indicated in previous correspondence, the FAA completed a study of the risks of structural damage posed by wildlife/aircraft collisions. The Safety Board notes that as a result of this study, the FAA is no longer considering allowing high-speed, low-level airplane operations to facilitate air traffic flow (over 250 knots, below 10,000 feet). If the FAA does consider these operations in the future, it will further evaluate the potential risk of increased bird strike hazards to these airplanes.

The FAA's action fully meets the intent of Safety Recommendation A-99-93; accordingly, the recommendation is classified "Closed--Acceptable Action."

Recommendation # A-99-094

Overall Status
CAA

Priority

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: WITH REPRESENTATIVES FROM THE U.S. DEPT. OF AGRICULTURE, THE DEPT. OF THE INTERIOR, THE DEPT. OF DEFENSE, AND THE U.S. ARMY CORPS OF ENGINEERS, CONVENE A TASK FORCE TO ESTABLISH A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATION BETWEEN AVIATION SAFETY AGENCIES AND WILDLIFE CONSERVATION INTERESTS.

FAA	Closed - Acceptable Action	12/4/2003

2/14/2000 Addressee

Letter Mail Controlled 02/22/2000 3:50:06 PM MC# 2000289 THE FAA AGREES WITH THE INTENT OF THIS RECOMMENDATION. IN 1997, THE FAA FORMED AN INTERDEPARTMENTAL WORKING GROUP TO DRAFT A MEMORANDUM OF UNDERSTANDING (MOU) TO ADDRESS INTERDEPARTMENTAL COOPERATION AND COMMUNICATION REGARDING WILDLIFE AIRCRAFT ISSUES. REPRESENTATIVES FROM THE DEPT. OF INTERIOR, THE DEPT. OF TRANSPORTATION'S FAA, AND THE ENVIRONMENTAL PROTECTION AGENCY WERE ON THE WORKING GROUP. THE DRAFT MOU IS IN THE FINAL DEVELOPMENT STAGE. THE FAA WILL PROPOSE THAT THE DRAFT MOU BE REVISED TO PROVIDE FOR THE ESTABLISHMENT OF A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATION BETWEEN AVIATION SAFETY AGENCIES AND WILDLIFE CONSERVATION INTEREST GROUPS. I WILL KEEP THE BOARD INFORMED OF THE FAA'S PROGRESS ON THIS RECOMMENDATION.

5/11/2000 NTSB

PENDING THE ESTABLISHMENT OF A PERMANENT BIRD STRIKE WORKING GROUP, A-99-94 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."

9/15/2003 Addressee

Letter Mail Controlled 9/25/2003 2:04:01 PM MC# 2030496 The Federal Aviation Administration (FAA) formed an interdepartmental working group to draft a Memorandum of Agreement (MOA) to address interdepartmental cooperation and communication regarding wildlife aircraft issues. Representatives from the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of Interior, the Department of Transportation's FAA, and the Environmental Protection Agency were on the working group. The group has subsequently finalized the MOA, and a copy is enclosed for the Board's information.
The MOA provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups.
I believe that the FAA has satisfactorily responded to this safety recommendation, and I look forward to your response.

12/4/2003 NTSB

The Safety Board notes that the FAA formed an interdepartmental working group that drafted a memorandum of agreement (MOA) to address interdepartmental cooperation and communication regarding wildlife/aircraft issues. The MOA provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups. The MOA has been signed by the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of Interior, the FAA, and the Environmental Protection Agency.

With the signing of the MOA and the formation of the permanent Bird Strike Working Group, the FAA has completed the action recommended. As discussed at the Safety With A Team meeting on October 8, 2003, Safety Recommendation A-99-94 is classified "Closed--Acceptable Action."

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

Log Number **2764A**

Issue Date **11/19/1999** **KANSAS CITY MO** **3/4/1999**

ON 3/4/99, AT 2200 CENTRAL STANDARD TIME, A DOUGLAS DC-9-15F, N195US, OPERATED BY USA JET AIRLINES, INC., ENCOUNTERED A FLOCK OF LARGE BIRDS WHILE ON FINAL APPROACH FOR LANDING AT KANSAS CITY INT'L. AIRPORT, KANSAS CITY, MISSOURI. DURING THE ENCOUNTER, SEVERAL BIRDS WERE INGESTED INTO BOTH ENGINES, RESULTING IN SEVERE ENGINE POWER LOSS. THE PILOT REGAINED ENOUGH POWER IN ONE ENGINE TO CONTINUE THE APPROACH AND LAND THE AIRPLANE WITHOUT FURTHER INCIDENT. THERE WERE NO INJURIES. NIGHT VISUAL METEOROLOGICAL CONDITIONS PREVAILED AT THE TIME OF THE ENCOUNTER, AND AN INSTRUMENT FLIGHT RULES (IFR) FLIGHT PLAN HAD BEEN FILED FOR THE NONSCHEDULED DOMESTIC AIR CARGO FLIGHT. THE FLIGHT WAS CONDUCTED UNDER THE PROVISIONS OF 14 CODE OF FEDERAL REGULATIONS (CFR) PART 121.

Recommendation # A-99-095 **Overall Status** **Priority**

CAA

THE NTSB RECOMMENDS TO THE U.S. DEPT. OF AGRICULTURE: PARTICIPATE IN A TASK FORCE, TO BE CONVENED BY THE FEDERAL AVIATION ADMINISTRATION, TO ESTABLISH A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATION BETWEEN AVIATION SAFETY AGENCIES AND WILDLIFE CONSERVATION INTERESTS.

DEPARTMENT OF AGRICULTURE	Closed - Acceptable Action	7/26/2005

1/3/2000	Addressee	Letter Mail Controlled 01/10/2000 4:31:10 PM MC# 2000039 I APPRECIATE YOUR INVITATION, AND I AM PLEASED THAT USDA CAN HELP FURTHER ADDRESS THIS SERIOUS PROBLEM BY PARTICIPATING IN THE TASK FORCE. USDA IS ALSO CONCERNED ABOUT THIS ISSUE, AND OUR ANIMAL AND PLANT HEALTH INSPECTION SERVICE (APHIS) REMAINS COMMITTED TO REDUCING THE RISK POSED TO HUMANS AND AIRCRAFT CAUSED BY BIRD AND OTHER WILDLIFE STRIKES. IN THIS REGARD, APHIS PROVIDED TECHNICAL OR DIRECT WILDLIFE HAZARD CONTROL ASSISTANCE TO 363 AIRPORTS IN 47 STATES AND GUAM IN FISCAL YEAR 1999. HOWEVER, USDA REALIZES THAT FURTHER COORDINATION WITH OUR PARTNERS WILL HELP US DIRECT OUR RESOURCES MORE EFFECTIVELY AND BENEFIT OUR WORK AT U.S. AIRPORTS. ACCORDINGLY, USDA LOOKS FORWARD TO WORKING WITH FAA OFFICIALS AND THE OTHER MEMBERS OF THE TASK FORCE WHEN A BIRD STRIKE MEETING IS CONVENED. DR. RICHARD DOLBEER, WITH APHIS' WILDLIFE SERVICES PROGRAM, WILL SERVE AS USDA'S REPRESENTATIVE TO THE TASK FORCE. DR. DOLBEER'S ADDRESS IS WILDLIFE SERVICES/NATIONAL WILDLIFE RESEARCH CENTER, APHIS, USDA, C/O PLUM BROOK STATION, 6100 COLUMBUS AVENUE, SANDUSKY, OH 44870. TELEPHONE IS 419-625-0242. THANK YOU AGAIN FOR YOUR LETTER.
3/8/2000	NTSB	PENDING THE INFORMATION OF THE BIRD STRIKE WORKING GROUP, A-99-95 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."
9/15/2003	Addressee	The Federal Aviation Administration (FAA) formed an interdepartmental working group to draft a Memorandum of Agreement (MOA) to address interdepartmental cooperation and communication regarding wildlife aircraft issues. Representatives from the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of Interior, the Department of Transportation's FAA, and the Environmental Protection Agency were on the working group. The group has subsequently finalized the MOA, and a copy is enclosed for the Board's information. The MOA provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups.
7/26/2005	NTSB	Through correspondence with the FAA, the Safety Board is aware of the interdepartmental working group it formed and of the memorandum of agreement (MOA) that this group drafted to address interdepartmental cooperation and communication regarding wildlife/aircraft issues. The MOA, which has been signed by the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of the Interior, the FAA, and the Environmental Protection Agency, provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups. With the signing of the MOA and the formation of the permanent Bird Strike Working Group, the USDA has completed the action recommended. Accordingly, Safety Recommendation A-99-95 is classified "Closed--Acceptable Action."

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

8/31/2005	Addressee	Letter Mail Controlled 9/8/2005 12:27:19 PM MC# 2050415 (Identified as a "No Response Necessary") We are pleased that Department of Agriculture officials were active participants in the collaborative efforts convened by the Federal Aviation Administration to establish an interdepartmental bird strike working group to help facilitate communication between aviation safety agencies and natural resource conservation interests. Officials from our Animal and Plant Health Inspection Service (APHIS) played a key role in the development of the multi-agency memorandum of agreement (MOA), which established the bird strike working group. APHIS officials have now implemented the MOA and employ its principles to resolve aircraft bird strike issues at the lowest possible level with other Agency and special interest group field representatives whenever possible. Please be assured that we will continue to promote interdepartmental cooperation and partnering to effectively reduce threats to aviation caused by wildlife.

Recommendation Report

Friday, September 05, 2008
NOTATION:7192

Log Number **2764B**
Issue Date **11/19/1999** **KANSAS CITY MO** **3/4/1999**

ON 3/4/99, AT 2200 CENTRAL STANDARD TIME, A DOUGLAS DC-9-15F, N195US, OPERATED BY USA JET AIRLINES, INC., ENCOUNTERED A FLOCK OF LARGE BIRDS WHILE ON FINAL APPROACH FOR LANDING AT KANSAS CITY INT'L. AIRPORT, KANSAS CITY, MISSOURI. DURING THE ENCOUNTER, SERVER BIRDS WERE INGESTED INTO BOTH ENGINES, RESULTING IN SEVERE ENGINE POWER LOSS. THE PILOT REGAINED ENOUGH POWER IN ONE ENGINE TO CONTINUE THE APPROACH AND LAND THE AIRPLANE WITHOUT FURTHER INCIDENT. THERE WERE NO INJURIES. NIGHT VISUAL METEOROLOGICAL CONDITIONS PREVAILED AT THE TIME OF THE ENCOUNTER, AND AN INSTRUMENT FLIGHT RULES (IFR) FLIGHT PLAN HAD BEEN FILED FOR THE NONSCHEDULED DOMESTIC AIR CARGO FLIGHT. THE FLIGHT WAS CONDUCTED UNDER THE PROVISIONS OF 14 CODE OF FEDERAL REGULATIONS (CFR) PART 121.

Recommendation # A-99-096 **Overall Status** **Priority**
CAA

THE NTSB RECOMMENDS THAT THE U.S. ARMY CORPS OF ENGINEERS: PARTICIPATE IN A TASK FORCE, TO BE CONVENED BY THE FEDERAL AVIATION ADMINISTRATION, TO ESTABLISH A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATION BETWEEN AVIATION SAFETY AGENCIES AND WILDLIFE CONSERVATION INTERESTS.

U.S. ARMY CORPS OF ENGINEERS	Closed - Acceptable Action	7/26/2005

12/21/1999	Addressee	ON BEHALF OF THE SECRETARY OF THE ARMY, HONORABLE LOUIS CALDERA, I AM RESPONDING TO YOUR LETTER OF 11/19/99, INVITING THE U.S. ARMY CORPS OF ENGINEERS TO PARTICIPATE ON A TASK FORCE TO ESTABLISH A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATIONS BETWEEN AVIATION INTERESTS AND WILDLIFE CONSERVATION INTERESTS. IN RECENT YEARS THE CORPS HAS DEVELOPED AND CONSTRUCTED MANY ECOSYSTEM RESTORATION PROJECTS AND OUR EXPERIENCE COULD PROVE BENEFICIAL TO THE WORKING GROUP. I LOOK FORWARD TO PARTICIPATE ON THE BIRD STRIKE WORKING GROUP.
2/25/2000	NTSB	THE SAFETY BOARD APPRECIATES YOUR EFFORTS TO IMPROVE AVIATION SAFETY THROUGH YOUR PARTICIPATION IN THIS TASK FORCE. THE FAA WILL NOTIFY ALL PARTICIPANTS WHEN THE TASK FORCE IS TO BE ASSEMBLED. PENDING THE COMPLETION OF THIS PROJECT, A-99-96 IS CLASSIFIED "OPEN--ACCEPTABLE RESPONSE."
9/15/2003	Addressee	The Federal Aviation Administration (FAA) formed an interdepartmental working group to draft a Memorandum of Agreement (MOA) to address interdepartmental cooperation and communication regarding wildlife aircraft issues. Representatives from the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of Interior, the Department of Transportation's FAA, and the Environmental Protection Agency were on the working group. The group has subsequently finalized the MOA, and a copy is enclosed for the Board's information. The MOA provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups.
7/26/2005	NTSB	Through correspondence with the FAA, the Safety Board is aware of the interdepartmental working group it formed and of the memorandum of agreement (MOA) that this group drafted to address interdepartmental cooperation and communication regarding wildlife/aircraft issues. The MOA, which has been signed by the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of the Interior, the FAA, and the Environmental Protection Agency, provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups. With the signing of the MOA and the formation of the permanent Bird Strike Working Group, the U.S. Army Corps of Engineers has completed the action recommended. Accordingly, Safety Recommendation A-99-96 is classified "Closed--Acceptable Action."

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

Log Number 2764C
Issue Date 11/19/1999 KANSAS CITY MO 3/4/1999

ON 3/4/99, AT 2200 CENTRAL STANDARD TIME, A DOUGLAS DC-9-15F, N195US, OPERATED BY USA JET AIRLINES, INC., ENCOUNTERED A FLOCK OF LARGE BIRDS WHILE ON FINAL APPROACH FOR LANDING AT KANSAS CITY INT'L. AIRPORT, KANSAS CITY, MISSOURI. DURING THE ENCOUNTER, SEVERAL BIRDS WERE INGESTED INTO BOTH ENGINES, RESULTING IN SEVERE ENGINE POWER LOSS. THE PILOT REGAINED ENOUGH POWER IN ONE ENGINE TO CONTINUE THE APPROACH AND LAND THE AIRPLANE WITHOUT FURTHER INCIDENT. THERE WERE NO INJURIES. NIGHT VISUAL METEOROLOGICAL CONDITIONS PREVAILED AT THE TIME OF THE ENCOUNTER, AND AN INSTRUMENT FLIGHT RULES (IFR) FLIGHT PLAN HAD BEEN FILED FOR THE NONSCHEDULED DOMESTIC AIR CARGO FLIGHT. THE FLIGHT WAS CONDUCTED UNDER THE PROVISIONS OF 14 CODE OF FEDERAL REGULATIONS (CFR) PART 121.

Recommendation # A-99-097 **Overall Status** CAA **Priority**

THE NTSB RECOMMENDS THAT THE U.S. DEPT. OF DEFENSE: PARTICIPATE IN A TASK FORCE, TO BE CONVENED BY THE FEDERAL AVIATION ADMINISTRATION, TO ESTABLISH A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATION BETWEEN AVIATION SAFETY AGENCIES AND WILDLIFE CONSERVATION INTERESTS.

DOD	Closed - Acceptable Action	3/8/2000

12/8/1999 Addressee

Thank you for informing me of NTSB's recommendation for the Department of Defense (DOD) to participate in Federal Aviation Administration's (FAA) task force to establish a bird strike working group. We strongly support your interest in reducing wildlife hazards to aviation. All military services share the air, airfields and wildlife risks with commercial aviation.

As you know, personnel from the Air Force Bird/Wildlife Strike Hazard (BASH) Team have already attended two meetings to support this effort. BASH Team members held meetings on November 29-30 with representatives from the FAA. We invited their participation in our development efforts to use radar technology to provide forecasts of large bird migrations that may affect flight safety. Attendees at this meeting laid the foundation for achieving the intent of recommendation A-99-97. The next meeting of this working group is scheduled for February 16, 2000, at the FAA Technical Center to identify areas where our DOD BASH work can benefit civil aviation.

Thank you for inviting us to provide members to the task force. I've asked the Air Force Safety Center's BASH Team to provide the DOD representation. If you have any questions, please contact Maj. Peter R. Windler, BASH Team Chief at (505) 846-5679 or Eugene A. LeBoeuf at (505) 8465679.

3/8/2000 NTSB

The Air Force states that its Bird/Wildlife Strike Hazard (BASH) Team has already attended two meetings to support this effort. BASH Team members held meetings on November 29 and 30 with representatives from the FAA. The Air Force also states that the BASH Team has invited the FAA to participate in its efforts to begin using radar technology to provide forecasts of large bird migrations that may affect flight safety. The Air Force reports that the working group met on February 16, 2000, at the FAA Technical Center.

The Safety Board acknowledges the outstanding effort the Air Force has made in aviation safety supporting bird strike prevention measures and encourages it to continue this effort with the FAA and other parties. Because the Air Force represents the DOD in this matter and its actions meet the intent of Safety Recommendation A-99-97, it is classified "Closed--Acceptable Action."

Recommendation Report

Friday, September 05, 2008

NOTATION:7192

Log Number **2764D**

Issue Date **11/19/1999** **KANSAS CITY MO** **3/4/1999**

ON 3/4/99, AT 2200 CENTRAL STANDARD TIME, A DOUGLAS DC-9-15F, N195US, OPERATED BY USA JET AIRLINES, INC., ENCOUNTERED A FLOCK OF LARGE BIRDS WHILE ON FINAL APPROACH FOR LANDING AT KANSAS CITY INT'L. AIRPORT, KANSAS CITY, MISSOURI. DURING THE ENCOUNTER, SEVERAL BIRDS WERE INGESTED INTO BOTH ENGINES, RESULTING IN SEVERE ENGINE POWER LOSS. THE PILOT REGAINED ENOUGH POWER IN ONE ENGINE TO CONTINUE THE APPROACH AND LAND THE AIRPLANE WITHOUT FURTHER INCIDENT. THERE WERE NO INJURIES. NIGHT VISUAL METEOROLOGICAL CONDITIONS PREVAILED AT THE TIME OF THE ENCOUNTER, AND AN INSTRUMENT FLIGHT RULES (IFR) FLIGHT PLAN HAD BEEN FILED FOR THE NONSCHEDULED DOMESTIC AIR CARGO FLIGHT. THE FLIGHT WAS CONDUCTED UNDER THE PROVISIONS OF 14 CODE OF FEDERAL REGULATIONS (CFR) PART 121.

Recommendation # A-99-098

Overall Status CAA

Priority

THE NTSB RECOMMENDS THAT THE U.S. DEPT. OF INTERIOR: PARTICIPATE IN A TASK FORCE, TO BE CONVENED BY THE FEDERAL AVIATION ADMINISTRATION, TO ESTABLISH A PERMANENT BIRD STRIKE WORKING GROUP TO FACILITATE CONFLICT RESOLUTION AND IMPROVE COMMUNICATION BETWEEN AVIATION SAFETY AGENCIES AND WILDLIFE CONSERVATION INTERESTS.

DEPARTMENT OF THE INTERIOR	Closed - Acceptable Action	7/26/2005

3/29/2001	NTSB	Although the Safety Board has heard from the organizations to whom similar recommendations were issued, Board records indicate that DOI has not responded concerning this recommendation. The other organizations have indicated their agreement to participate in the task force when formed, and the FAA has indicated that it is forming the task force. The Board would appreciate learning of any current, completed, or planned activities that DOI has taken in response to the recommendation. If there are no current or planned activities, please so inform the Board so that we may close the recommendation. A copy of the recommendation letter is enclosed for your reference.
3/4/2002	Addressee	The U.S. Fish and Wildlife Service was part of the original interdisciplinary panel that reviewed aviation safety issues associated with bird strikes and suggested the idea of a bird strike working group in the spring of 1999. Most recently, we participated in an ad hoc working group organized by the Federal Aviation Administration to draft an interagency agreement on bird strikes. The Service fully intends to participate as an active member of the task force and the bird strike working group when they are formed.
5/17/2002	NTSB	The Safety Board thanks the FWS for this update on actions taken in response to the recommendation. Pending completion of the interagency agreement and creation of the task force, Safety Recommendation A-99-98 is classified "Open--Acceptable Response."
9/15/2003	Addressee	The Federal Aviation Administration (FAA) formed an interdepartmental working group to draft a Memorandum of Agreement (MOA) to address interdepartmental cooperation and communication regarding wildlife aircraft issues. Representatives from the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of Interior, the Department of Transportation's FAA, and the Environmental Protection Agency were on the working group. The group has subsequently finalized the MOA, and a copy is enclosed for the Board's information. The MOA provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups.
7/26/2005	NTSB	Through correspondence with the FAA, the Safety Board is aware of the interdepartmental working group it formed and of the memorandum of agreement (MOA) that this group drafted to address interdepartmental cooperation and communication regarding wildlife/aircraft issues. The MOA, which has been signed by the Department of Agriculture, the Department of Commerce, the Department of Defense, the Department of the Interior, the FAA, and the Environmental Protection Agency, provides for the establishment of a permanent Bird Strike Working Group to facilitate conflict resolution and improve communication between aviation safety agencies and wildlife conservation interest groups. With the signing of the MOA and the formation of the permanent Bird Strike Working Group, the Department of the Interior has completed the action recommended. Accordingly, Safety Recommendation A-99-98 is classified "Closed--Acceptable Action."

Recommendation Report

Friday, September 05, 2008
NOTATION:7192

Total Number of Recommendations for Recommendation Report: 13

Selection for Report:
NOTATION:7192

Written Testimony of Gary W. Andrews

Submitted to the House Committee on Transportation, Subcommittee on Aviation

February 24, 2009 Hearing on the US Airways Flight 1549 Accident

Chief Executive Officer

DeTect, Inc.

Panama City, Florida

(850) 763-7200

March 4, 2009
Written Testimony of Gary W. Andrews
CEO, DeTect, Inc. Panama City, Florida USA
to the House Subcommittee on Aviation

My name is Gary W. Andrews and I am the Chief Executive Officer of DeTect, Inc. of Panama City, Florida USA. DeTect, Inc. (www.detect-inc.com). I appreciate the opportunity to submit this testimony to the House Subcommittee on Aviation related to the recent US Airways flight 1549 aircraft-bird strike (birdstrike) incident and present my perspectives and experience with respect to bird radars, birdstrike management and the FAA bird radar program.

My company, DeTect, is a U.S. small business founded in Panama City, Florida in 2003 that specializes in bird radar technologies for real-time detection, tracking and alerting of aircraft-bird strike risk. DeTect has a highly qualified staff of experts in radar technology, radar ornithology, aviation safety, airport bird control/wildlife and bird-aircraft strike hazard (BASH) management that includes Mr. Ron Merritt (USAF Maj. Ret.), who was the former Chief of the US Air Force (USAF) BASH Team, and Mr. T. Adam Kelly, the former Head of USAF Bird Control in Europe (Third Air Force). Other relevant DeTect experts include former USAF contractor bird control staff; former U.S. Department of Agriculture Wildlife Services (USDA WS) bird/wildlife control personnel; licensed falconers; and US Federal Aviation Administration (FAA) Qualified Wildlife Biologists. DeTect's staff have provided BASH risk assessment, planning, control and bird radar services and systems at over 200 military airfields and commercial airports worldwide that includes military airfields and commercial airports throughout North and South America, Canada, Europe, Asia and Africa. At present, over 70% of DeTect's business is related to manufacturing, sale and support of its bird radar systems for aircraft-bird strike prevention and environmental management with over 50% of the systems we manufacture being exported.

Bird Radar History

Mr. Merritt, Mr. Kelly and other DeTect staff worked on many of the initial USAF "bird radar" studies in the 1980's while with the USAF and throughout the 1990's with a government contractor based in Plano, Texas (Geo-Marine, Inc., www.geo-marine.com). Mr. Kelly was a renown radar ornithologist and airfield bird control expert from England (now a US citizen) who was requested to come to the US to work for the USAF on these early bird radar programs. I am the former Chief Operating Officer for Geo-Marine and met Mr. Merritt and Mr. Kelly at Geo-Marine.

While with the USAF and later at Geo-Marine, Mr. Merritt and Mr. Kelly and other current DeTect staff developed the USAF Avian Hazard Advisory System (AHAS, see the public website at www.usahas.com) that uses the US national weather radar network (NEXRAD) to provide near real-time bird radar data (updated every six minutes) delivering birdstrike risk ratings to US military flying units for military training routes, ranges and airfields in the continental U.S., Hawaii, Alaska, Guam and Korea (currently being added). DeTect, with another US government contractor, currently operates the AHAS bird radar system from DeTect's offices in Florida providing on-going system development, operation and user support. The National Transportation Safety Board (NTSB) in November of 1999 recommended that the AHAS bird radar system be evaluated by the FAA for use to support birdstrike risk management for commercial aviation (reference NTSB A-99-86 through -94) however as of this date no US

commercial airports are known to be using the data although interest has recently been renewed in the aftermath of the US Airways birdstrike.

By 2000, Kelly and Merritt had also developed an on-airport, close-in, real-time, automated bird radar system (the Mobile Avian Radar System or MARS) for Geo-Marine which is still on the market. MARS was the first real-time bird radar system to be used operationally at a military airfield and commercial airport with units operating the US and United Kingdom (UK). The MARS bird radar at the Royal Air Force (RAF) base in Kinloss, Scotland was installed in 2003 and provides real-time display of bird activity on computer displays in the airfield control tower with controllers providing real-time birdstrike risk advisories to pilots based on information provided by the bird radar. The UK Central Science Lab (CSL) Bird Management Unit (part of the UK environmental agency, DEFRA) has validated this bird radar for operational use. Geo-Marine also installed a MARS unit at the Augusta Regional Airport in 2003 which was the first use of a bird radar at a US airport.

DeTect, Inc.

Mr. Merritt and Mr. Kelly founded DeTect in 2003 and today, US-based DeTect is a leader in development, delivery, operation and support of bird radar remote sensing systems for real-time aircraft-bird collision (strike) risk avoidance. DeTect's MERLIN™ Aircraft Birdstrike Avoidance Radar system (MERLIN), first offered commercially in 2003, is the most advanced, proven and widely-used technology available for real-time bird detection and aircraft-bird strike risk management with over 40 MERLIN bird radar systems operating worldwide in aviation safety and environmental applications.

The standard MERLIN bird radar uses two wide-beam radars with one radar sensor scanning in the horizontal to detect and track birds around the airfield with bird detection ranges out to 8 miles, and the second radar sensor aligned with the runway and scanning in the vertical (in a windmill fashion) to detect and track birds above the runway and in, below and above the runway approach and departure corridors with bird detection ranges out to 4 miles. For large, multi-runway airports, multiple radar sensors are used to provide dedicated coverage of each runway and its corridors as well as for the area surrounding the airport.

The wide-beam radars used in MERLIN (as opposed to narrow beam radars used in some bird radars) scan a large volume of airspace and detect and track birds from within a few meters of the ground level to above aircraft flight altitudes. The ability to detect birds close to the ground is critical for birdstrike prevention at commercial airports as 85% of aircraft-bird strikes occur under 500 feet above the ground level based on data from the US Department of Agriculture Wildlife Services (USDA WS).

MERLIN bird radars also use longer wavelength S-band radars which provide superior bird detection over ground clutter and water; are not subject to insect contamination problems; and, can detect and track birds in wet fog and rain. Birds do fly in weather - particularly at coastal airports and during migration - and these conditions represent the most dangerous times for birdstrikes as airport bird control staff, air traffic controllers and pilots cannot see the birds and the birds cannot "see and avoid" the aircraft (the bird radar being evaluated by the FAA since 2007 at Seattle-Tacoma airport is a short wavelength X-band system that is "blinded" by

wet fog and even light rain and is subject to false positives due to insects that are also picked up by the radar).

MERLIN is production model technology – not an R&D or experimental bird radar system - was privately developed, and, as of this date, is only one of two "commercially available" operational systems providing real-time data on the market to my knowledge. MERLIN is also, to my knowledge, the only system with automated birdstrike risk warning being used operationally by air traffic controllers. MERLIN is currently used to provide real-time aircraft-bird strike risk avoidance by the USAF at six US installations (the Dare County Bombing Range, North Carolina; Dover AFB, Delaware; Whiteman AFB, Missouri; Beale AFB, California; Offutt AFB, Nebraska and a mobile system for the USAF BASH Team at Kirtland AFB, New Mexico). The Dare County Range MERLIN unit has been used operationally by the USAF since 2003 with a real-time display in the control tower. The USAF reports that, prior to use of the MERLIN bird radar at the Dare County Range, the USAF had 1-2 Class A birdstrikes (damage >$1 million) and 3-5 Class B birdstrikes (damage form $500K to $1 million) annually to aircraft using the range. Since installation of the MERLIN system, the Range has not had any Class A or B birdstrikes in areas covered by the MERLIN system generating a cost savings of over $3 million per year. The USAF has also been able to increase use of the range based on the availability of real-time information provided by the system (previously the range would be closed for extended period of heavy bird activity such as migratory seasons).

In 2005 the US space shuttle launch vehicle struck a Turkey vulture during launch at the Kennedy Space Center (KSC). The U.S. National Aeronautics and Space Administration (NASA) determined that if the vulture had actually hit the space shuttle, potentially catastrophic damage to the heat tiles could have resulted. Birdstrikes were subsequently ranked as the second highest safety risk for the shuttle Return-to-Flight. In 2006, NASA conducted a detailed evaluation of available technologies including camera and bird detection radars for birdstrike risk avoidance and tested two bird radar systems at the KSC. The two systems tested were a US Navy-owned BirdRad bird radar (now sold as the "Accipiter" by the Canadian manufacturer, Sicom Systems, Ltd.) and a DeTect-owned MERLIN bird radar system (the Accipiter is the same system that the FAA has installed at Seattle-Tacoma airport in 2007 under its bird radar evaluation program and is now installing at Chicago O'Hare airport and plans to install at the New York JFK airport).

The NASA evaluation of bird radars was conducted by the NASA Low Orbit Radar Group which consisted of NASA radar engineers supported by US Navy radar experts from the Patuxent River Naval Air Station using a detailed, written evaluation plan with defined scientific and engineering test methods. Both the Accipiter and MERLIN bird radar systems were tested on-site for bird detection at the KSC in April and June 2006 and a detailed test report was produced by NASA on the evaluation.

NASA selected the MERLIN technology to support space shuttle launch safety and in June of 2006 ordered a MERLIN bird radar. The MERLIN system was used to provide real-time bird detection during the space shuttle Return-to-Flight launch on July 4, 2006 with remote, real-time display of bird activity provided to the NASA Launch Control Center. A second MERLIN unit was ordered by NASA and delivered to the KSC in 2007 and the MERLIN bird radar has

been used on all space shuttle launches since 2006 (11 to date). In addition to supplying the MERLIN technology, DeTect assisted the NASA and Navy engineers in developing operational procedures (concept of operations or CONOPS) for use of the MERLIN bird radar during launch, supported certification testing of the NASA MERLIN bird radars, and continues to provide a support team of bird radar and bird control experts for each launch.

Commercial airport use of bird radar technology has been slower to develop based on the need for agencies such as the FAA to "approve" the systems for funding under the Airport Improvement Program (AIP) although overseas interest in DeTect's MERLIN system has been significant. MERLIN systems are currently in use at a landfill at the end of the runway of the Louisville airport (Kentucky); by the UK CSL Bird Management Unit (two systems supporting UK airports and environmental projects); at the Calgary airport in Alberta, Canada; and, at the Durban airport in South Africa. The Louisville MERLIN system was purchased and is operated (24-7 since 2004) by the landfill company (Waste Management of Kentucky LLC) and was required to be installed by the FAA as a condition for expansion of the landfill which is located at the end of the main runway for the airport. The bird radar is used to alert the landfill bird control staff of areas of elevated bird activity, provide alerts to the airport of high risk conditions, and to document that the bird control program maintains the level of bird activity on the landfill at or below the background level for the surrounding area. The Calgary airport MERLIN system provides information on bird activity to the airport operations office and bird control staff. The Durban airport in South Africa in 2007 evaluated commercially available bird radars in 2007 and ordered a MERLIN system in 2008 under a competitively sourced open bid. The MERLIN bird radar system was delivered to the airport in December 2008, is currently operating in start-up mode, and will be the first operational use of a bird radar in the air traffic control tower at a commercial airport in the world.

FAA Bird Radar Evaluation Program Experience

The FAA Tech Center has had a bird radar evaluation program underway since around 2000 and, to date, has evaluated only two experimental bird radars: the Waveband Birdar (www.waveband.com) and the Sicom Accipiter (www.accipiterradar.com). The Birdar was evaluated at DFW and O'Hare airports in Texas in 2001-2002; the Accipiter was installed at Seattle-Tacoma airport in Washington in 2007 and is currently reported to be installed at Chicago O'Hare airport with reported plans to install a third Accipiter at JFK airport. The FAA bird radar evaluation program is being conducted by the University of Illinois Champaign (UIUC) funded by grants from the FAA. According to FAA records, since 2004 the FAA has provided $3.496 million in funds to the UIUC researcher, Dr. Edwin Herricks, for the bird radar evaluation (FAA grants website (www.faa.gov/ AA_NABSAS/UIUC /Grants /UIUC_Herricks_Grants_2009-02-25). According to the UIUC website, Dr. Herricks is an ecologist principally focused on climate change research (see http://cee.uiuc.edu /Faculty/herricks.htm).

As of the date of this testimony, the DeTect MERLIN bird radar has not been evaluated and no contract is in place to do so. Additionally, as of the date of this testimony and to my knowledge, no one from the FAA has ever seen a MERLIN radar in operation although DeTect

has repeatedly invited FAA personnel involved in the bird radar evaluation to visit MERLIN installations including systems at Dover AFB, Delaware and at NASA KSC in Florida.

In February 2006, I attended a meeting hosted by the FAA in Colorado Springs, Colorado to discuss development of a North American Birdstrike Advisory System (NABSAS) that was to include evaluation of bird radars for use at U.S. and Canadian commercial airports. The meeting consisted of a Bird Radar Working Group comprised of representatives from the FAA Tech Center, UIUC, various US airports, Transport Canada, the USAF, the US Navy and BASH consultants. Three companies that supplied or were developing bird radars were in attendance and provided presentations on their technology: Waveband (the Birdar), Sicom (the BirdRad, now called the Accipiter) and DeTect (MERLIN). UIUC also presented information on its bird radar evaluation work conducted since 2000 and its historical bird activity 3-D data models it had developed. I am not aware if other bird radar manufacturers and/or developers such as Geo-Marine or TNO (www.tno.nl, Robin Late bird radar) were invited to attend. I specifically noted that no main end users of bird radar information (air traffic controllers or pilots) were present at the meeting.

On the last day of the meeting, as I was waiting in the hotel lobby to go to the airport, I was invited to attend the last day "wrap-up" meeting where each attendee provided his/her input and comments (the other vendors had left the day before). In this wrap-up meeting, it was the general consensus of the group that bird radars were still "in R&D", were not "usable", and that "more research was needed". I was allowed to provide my comments last and objected to these conclusions as DeTect had presented information that MERLIN systems were already in operational use providing real-time information and that DeTect offered systems commercially for sale with performance guarantees and warranties. I stressed that while some systems might be considered to be still R&D projects, other systems were far more advanced and were ready for operational deployment and indeed were already being used operationally to provide real-time information on hazardous bird activity around airfields. I suggested that the FAA program, as opposed to having the group in attendance at that meeting arbitrarily decide what requirements bird radars should have, first conduct a market survey of prospective users (airfield managers, airfield bird control staff, air traffic controllers and pilots) to identify what the end users of a bird radar wanted in an operational system (something DeTect had already done as part of its development of MERLIN).

I also recommended that representatives of the Working Group should visit current installations of each known developer's/manufacturer's bird radars (not just the ones at this meeting) and that they should also visit each developer's/manufacturer's offices and manufacturing facility to assess the current state of each bird radar system as well as each company's production capacity. I specifically stated my concerns that the proposed FAA bird radar evaluation effort should not be "taxpayer funded R&D" for vendors and that each company that wanted to develop systems for the market should do so at its expense using private, not government funds. In closing, I reinforced my opinion that more research was not needed and that the effort should focus on installing and operating existing "commercially available" bird radar systems at commercial airports to assess their performance and get user feedback to identify features and functions needed to define how the information from these systems could

best be used operationally in the commercial airport environment (similar to the process that was already in place for military users).

The Working Group concluded that bird radar systems would be installed for "operational evaluation" at various airports with Sicom installing an Accipiter system at Seattle-Tacoma airport (SEA) and DeTect installing MERLIN systems at JFK airport (JFK) and Dallas-Fort Worth airport (DFW). The group additionally agreed that the effort would specifically focus on "commercially available" bird radar systems that were "on the market" and not on technologies under development.

DeTect's Experience with the FAA Bird Radar Program

In April 2006, I received a request for proposal (RFP) from UIUC (Dr. Herricks) to supply a MERLIN system to the Seattle-Tacoma airport. This was a surprise to me as it had been decided at the February NABSAS meeting, as noted above, that a Sicom Accipiter would be installed at the Seattle-Tacoma airport with DeTect MERLIN bird radars installed at JFK and DFW airports. I communicated my confusion to UIUC but was assured by Dr. Herricks that the Seattle-Tacoma airport installation had not been pre-decided. DeTect accordingly submitted information in response, however UIUC awarded the contract to Sicom using a "sole source" justification that Sicom was the only company that could meet the specification requirement. DeTect subsequently protested the process to both the UIUC and FAA as I believed that the end result of the RFP process had been pre-determined and that there was no intent to award the bird radar installation to anyone but Sicom. DeTect's protest was rejected by the UIUC contracting office and Sicom subsequently issued a news release to the effect that the FAA has determined that their Accipiter radar was the only bird radar that could meet FAA requirements (the news release was removed from Sicom's website when DeTect protested to the FAA that statement misrepresented the facts and that the FAA has made no such decision).

In early 2007, UIUC contacted me about installing a DeTect MERLIN system at DFW airport and that there were not funds available for a MERLIN system at both DFW and JFK. UIUC also stated that it did not want to evaluate the full MERLIN system but wanted to "assess" only the "vertical radar component". I replied that MERLIN was an integrated system and that DeTect would not agree to let UIUC assess only part of the system which I likened to "test driving a car with the back wheels off" and then complaining that it "rode rough". The discussions on deploying a MERLIN system continued with no progress, and the FAA suggested that a meeting be held at the FAA Tech Center in Atlantic City in August to discuss MERLIN deployment issues between DeTect and UIUC with the FAA present.

The meeting was held August 29, 2007 and attended by me, Dr. Herricks of UIUC, and Ryan King and Paul Jones of the FAA. I stated DeTect's position that we would not agree to allow only part of the MERLIN system to be evaluated and that the program had been represented to us as being focused on "commercially available" bird radars and not just "parts" of the bird radars. I questioned the intent of testing only the vertical radar and asked if UIUC and/or the FAA was developing a "hybrid" bird radar by picking and choosing the parts of various systems. I stressed that the MERLIN bird radar had been developed and engineered to meet specific performance, cost and reliability requirements based on input from the end users that were incorporated into the design.

Dr. Herricks responded by stating that he "already knew everything about horizontal scanning radars" and did not need to test that part of DeTect's MERLIN bird radar. I pointed out that MERLIN used S-band radars for horizontal scanning with custom developed, proprietary radar processing software and asked if he had tested an S-band radar sensor. He replied that he had only tested an X-band however said that they "were essentially the same". I contested this statement citing the wavelength and power differences and stated that DeTect used the much more expensive S-band radars for specific reasons, as in our experience the S-band performed much better, had much less clutter interference, and did not suffer from insect contamination. During this meeting, Dr. Herricks admitted to me that he was "not a radar expert". The FAA also informed me that it was up to UIUC as to how the evaluation was conducted stating that "once the grant funds were sent to UIUC" that the FAA "had no control as to how the money was spent" and that its only recourse would be to deny future grants. When I expressed my surprise that taxpayer funds would be transferred under these conditions, Dr. Herricks provided confirmation stating that he could "spend the money however he wanted".

I had a follow-up meeting with Ryan King and Ed Herricks in August in Canada at the Bird Strike Committee conference to discuss the unresolved DeTect issues with the program and in a an email stated that DeTect could only participate in the program: (1) with a requirement that only complete MERLIN systems be tested and evaluated, (2) under a defined scope of work, evaluation plan and test methodology, (3) with a provision that DeTect be allowed to review any reports issued, provide comments and have its comments included as an addendum to the report, and, (4) under a non-disclosure agreement to protect any proprietary and confidential information that DeTect would disclose during the evaluation. I did not consider these to be unreasonable requests for a vendor whose equipment was to be evaluated in order to determine a standard, especially in light of the fact that the evaluation would be done by non-experts. Discussions continued through the end of 2007 and into 2008 at which time UIUC indicated that funding was not available to proceed with the MERLIN deployments.

Discussions between DeTect and UIUC restarted in June 2008 and Dr. Herricks made a trip to DeTect's Panama City office in July to discuss the deployment which now had funding. A MERLIN installation at DFW only would occur and JFK was no longer being considered. During the meetings and tour of our facility, Dr. Herrick's stated to me that he was not aware of the advanced level of DeTect's technology and had not understood DeTect's full capabilities to deploy complete bird radar systems as other vendors he had worked with were not "full system" companies. After this visit, I invited Dr. Herricks to attend a DeTect MERLIN User Training class in Panama City to be held in October in order to assist him and his staff to better understand how the MERLIN system operated and its capabilities.

Dr. Herricks attended only two days of the five-day class but afterwards informed me that he "did not like MERLIN's [radar] displays" and thought DeTect should use "a display we [UIUC] have developed". I pointed out to him that the MERLIN displays were developed based on input from air traffic controllers and pilots and specifically were designed to emulate the displays currently is use at airports. I also stated my concern that the UIUC was in the "development business" which I saw as a conflict of interest with its role as an evaluator. I also had understood from the FAA that the bird radar program was not a development program. During the visit, Dr. Herricks also stated that there was "no real difference" between DeTect's

MERLIN and the Sicom Accipiter, except that MERLIN had "better GUIs" (Graphical User Interfaces). Again, we contest this as there are many fundamental differences between MERLIN and Accipiter that include the radar sensors, scanning patterns, processing software, display formats, features and capabilities.

At about the same time as the class, UIUC requested a radar lease agreement from me which I provided and UIUC subsequently marked up and returned. I objected that the revised agreement had no provisions for an evaluation plan, test methodology or provision for DeTect to review and provide comments to reports. In December 2008, DeTect was advised that UIUC had submitted the agreement to UIUC counsel for further review to make sure it complied with the FAA grant. In January, I was advised by UIUC and Dr. Herricks that the only review DeTect would be allowed on reports would be to confirm that no proprietary information was disclosed.

After the US Airways flight 1549 birdstrike at LaGuardia, I received a new contract from UIUC on February 27, 2009. In this contract, DeTect was be required to supply a MERLIN system for "rigorous evaluation" however no evaluation plan or test methodology was specified nor did the agreement include a provision for DeTect review of and comment to reports. I emailed UIUC contracting to confirm the intent and asked if all vendors were required to agree to these provisions. UIUC contracting responded back to me on March 3 that "we [UIUC] will not agree to any obligation to provide an evaluation plan or protocol. Dr. Herricks is willing to provide DeTect with a Scope of Work". Dr. Herricks subsequently sent me a Statement of Work on March 4 that stated that the evaluation would have "particular attention paid to vertically spinning radar components" and listed a number of bullet items for "assessment" and "validation" of the system but with no specifics as to how the assessment or validation would be conducted.

Essentially, under the UIUC contract DeTect is being asked to turn over its technology to admitted non-radar experts for them to "assess" as they see fit with no defined test plan or methodology. DeTect does not do this with any customer, including the USAF and NASA. Every bird radar we sell comes with a minimum one year of operational support to ensure that the system operates at optimum while the user becomes fully competent with the system and it is successfully integrated into the customer's operations.

DeTect Current Status

DeTect is currently once again in good faith reviewing the UIUC Statement of Work and contract and will submit its comments and suggestions to UIUC; however, I candidly do not expect UIUC to agree to any of DeTect's requirements as UIUC's position today remains essentially as it was in 2007. The process is now further complicated by the fact that DeTect has now "raised the bar" in that our current MERLIN systems now all use state-of-the-art solid state radar technology that became available in late 2008 which makes the old magnetron-based systems such as the system the FAA has at Seattle-Tacoma airport obsolete. When advised of this new technology, UIUC indicated that it will likely want to evaluate the "old" MERLIN system, which makes no sense to me.

I do not believe that DeTect's position is unreasonable in that we have requested a written plan that will define how the evaluation will be conducted - similar to the plan NASA developed and provided to us when it was evaluating bird radars in 2006 and similar to the plan

that the US Navy provided us when it recently evaluated a MERLIN system as part of an operational trial. Over the past two years, I have repeatedly expressed my concerns that the FAA and UIUC are not following the intent of the FAA grant to UIUC by deploying technology that was '"on the market" and "ready for use" with "a stringent schedule and high performance expectations" – all criteria that UIUC cited as required by the FAA. I also have repeatedly expressed my concerns that the FAA bird radar program appeared to be a R&D program contrary to its stated mission. Ryan King of the FAA Tech Center specifically stated to me in 2007 that "the FAA is out of the business of [bird] radar development" and that the "FAA program is now focused on commercially available avian radar systems". Since that time, the FAA has qualified the definition stating that to me that "commercially available" means "offered for sale". By this definition I can say I have a car "for sale" that gets 500 miles per gallon and it will be considered "commercially available" even though I have never built one and do not currently possess the technology to do so.

It is my opinion that the bird radars deployed to date by the FAA are not "commercially available" and are, in fact, experimental R&D systems as stated by the FAA. As of today, to my knowledge the only bird radar system currently deployed under the FAA bird evaluation program is the Canadian Sicom Accipiter system at Seattle-Tacoma airport that Dr. Herricks was recently quoted in press reports as stating that still does not produce data in real time or data that is usable and will require "years more research". The FAA has recently also stated that "the FAA is developing bird radars", will require "years more development", and that bird radar information will never likely be used in the control tower. This is in direct contrast to the reality that MERLIN bird radars are currently being used to provide real-time information to airfield managers, controllers and pilots at military installations, at NASA and will soon be used in this capacity at overseas commercial airports.

The FAA has also advised DeTect that if it does not participate in the program then DeTect's MERLIN system could be excluded from qualifying for Airport Improvement Program (AIP) funding. DeTect is essentially in a "Catch 22": if we participate, the UIUC and FAA may decide that the MERLIN system is not the type of bird radar that they feel needs to be used, and DeTect will have no recourse in the decision - if DeTect does not participate, the UIUC and FAA will define the AIP requirement based on evaluation of only one experimental bird radar system which uses radars and processing that is fundamentally different from the other commercially available MERLIN, MARS and Robin Lite bird radars. Either way, DeTect's future business prospects are at risk both domestically and overseas. I believe that DeTect has legitimate concerns with the way the bird evaluation is being conducted and the lack of subject matter expertise on the evaluation team.

While this contract "stalemate" continues, UIUC and the FAA is proceeding with deployment of the Canadian Accipiter radar at other airports including O'Hare and reportedly JFK, even though the Accipiter, operating at Seattle-Tacoma airport for two years, is still not fully operable nor is the data usable according to the UIUC and FAA. "Broad brush" statements in the press by the FAA and UIUC after the US Airways birdstrike that bird radars are "not usable" is based only on the FAA's and UIUC's experience with only two experimental systems that, in my opinion, use the wrong sensors, is damaging DeTect's business as the statements, by implication, cast all bird radars into the same "not ready for use" category - even

though the FAA has never seen a MERLIN system in operation. The statements that the FAA and UIUC are "developing" bird radars in direct competition with DeTect and other private companies contradicts the way that the program has been represented to me in the past. It is also a clear conflict-of-interest for the FAA and UIUC to be both the "evaluator" and a "developer".

The FAA and UIUC have invested nine years and at least $4 million in evaluating bird radars, yet have not been able to define an operational requirement, deploy operational bird radars nor develop operational procedures to use the systems at commercial airports, and have said that years of additional research is needed. In contrast, over a 12 month period in 2005-6, NASA, with the assistance of Navy radar experts, assessed the market for bird radar systems; tested and evaluated systems at KSC; developed operational procedures; and, procured and deployed a real-time bird radar system operationally - a system that to date has provided real-time birdstrike safety support for eleven space shuttle launches. In rebuttal to this, the FAA recently asserted that commercial airport [bird radar] applications require "a much higher level of reliability" than military and NASA uses. I would contest this statement, as I believe would my USAF and NASA MERLIN users - NASA will not launch the $2 billion space shuttle without a MERLIN bird radar and has made it clear to DeTect that it requires the highest level of reliability – both in performance in bird detection and operational stability, as has the USAF.

Meanwhile, as I predicted at the 2006 FAA NABSAS meeting in Colorado Springs, while the FAA has researched, private sector firms such as DeTect have already moved bird radars into operational use advancing the technology with solid-state radars and real-time bird activity data and automatic birdstrike risk alerts being delivered to bird control staff, airfield managers, air traffic controllers and pilots. We at DeTect fully understand the operational differences between military and commercial aviation but operational procedures can quickly be developed to allow these systems to be used at US airports today and DeTect has the expertise to make this happen. Based on my experience with the FAA bird radar program, I would suggest that it be refocused towards a more methodical, scientifically sound evaluation with a defined list of precise objectives under the direction of a team of qualified subject matter experts with proper oversight.

Do I have the "perfect" bird radar system? No … but the current level of bird radar technology is ready and can be deployed today to immediately improve pilot and passenger safety at US airports, and, as the technology proves its worth in birdstrike risk and cost reduction, the value delivered will support more advanced technologies. While we wait 10-20 more years for the "Star Wars" bird radar apparently envisioned by the FAA and UIUC, the flying public and aircrews will remain at risk. We have the technology to reduce that risk today and systems can be deployed quickly and effectively.

Submitted by:

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Statement of

W. Douglas Parker
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Before the

House Committee on Transportation & Infrastructure
Subcommittee on Aviation

The Honorable Jerry Costello
Chairman

US AIRWAYS FLIGHT 1549

February 24, 2009

Mr. Chairman and Members of the Subcommittee:

My name is Doug Parker, and I am Chairman and CEO of US Airways. On behalf of our family of 34,000 US Airways employees, thank you for this important opportunity to explore the lessons learned from our recent emergency water landing in New York City.

US Airways Flight 1549 ditched into the Hudson River adjacent to Manhattan at approximately 3:30 p.m. on January 15, 2009. The events of January 15th unfolded in a matter of minutes. While the NTSB investigation is ongoing, the facts confirmed so far are consistent with a bird strike which resulted in an un-commanded loss of thrust in both engines.

All 155 passengers and crew of Flight 1549 survived the accident and were rescued from the freezing waters of the Hudson River.

US Airways is extremely proud of the professional Crew of Flight 1549. These five outstanding aviation professionals performed in an exceptional manner under extraordinary circumstances. They represent the very finest in the long and proud tradition of airline professionals. We at US Airways appreciate the generous outpouring of support these five employees are receiving. We are particularly pleased their accomplishment is helping to build a greater understanding of the vital role they and their industry colleagues play in ensuring our national air transportation system remains the safest and most efficient in the world.

US Airways Flight 1549, an Airbus A320, departed LaGuardia Airport on January 15, 2009 at 3:25 p.m. en route to Charlotte, North Carolina. The flight was under the command of Captain Chesley Sullenberger, with First Officer Jeffrey Skiles, Flight Attendants Sheila Dail, Donna Dent, Doreen Welsh, with 150 passengers aboard. Two and a half minutes after takeoff, climbing out of 3,000 feet, Flight 1549 hit a flock of Canada Geese causing substantial damage to the left and right engines and loss of thrust. Captain Sullenberger took control of the aircraft from First Officer Skiles and notified Air Traffic Control of the emergency.

Captain Sullenberger quickly determined that a return to LaGuardia would not be possible as he was descending rapidly and headed away from the airport. He then explored the possibility of flying the crippled jet to Teterboro Airport but shortly thereafter determined that it would be impossible to reach the airport and that his only option was to land in the Hudson River. He transmitted his intentions to Air Traffic Control "We're going to be in the Hudson". Concurrently First Officer Skiles was performing the dual engine failure emergency checklist in an attempt to restore thrust to either engine. Captain Sullenberger commanded the passengers to brace for impact using the aircraft's public address system alerting the flight attendants to instruct the passengers to assume a brace

position. Two and a half minutes after striking the birds, Captain Sullenberger successfully landed the aircraft in the Hudson and commanded an evacuation.

The flight attendants, passengers and pilots efficiently evacuated all 155 passengers and crewmembers into two forward slide rafts and through the over-wing exits onto both wings of the aircraft as it was settling in the water. Within just a few minutes of touchdown ferry and rescue boats came to their aid and took them to the New Jersey and New York shores where emergency responders continued to assist the passengers and crew.

In addition to acknowledging the performance of the crew, today's hearing provides an opportunity for me to recognize the significant contribution made by hundreds of US Airways employees in the immediate aftermath of the accident and in the weeks that followed. They provided a broad range of support to the passengers and crew of Flight 1549, as well as to their families. On the day of the accident, there were still thousands of other flights to look after, as well as on every day since, and our US Airways family of 34,000 employees has demonstrated professionalism in staying focused and seeing to the needs of all of our passengers.

On behalf of everyone at US Airways, we are grateful for the way the people of New York City and the surrounding areas pulled together to help the passengers and crew of Flight 1549. I want to again thank the local New York and New Jersey Police and Fire departments, the U.S. Coast Guard, the New York Harbor Master, the many ferry boat operators and New York water taxis which responded, the New York Port Authority, and EMTs who came to our aid on January 15th. I also want to thank the Office of Emergency Management for the City of New York, the American Red Cross, the Salvation Army, and all of the other agencies and organizations which were part of the outstanding support team.

Finally, very deserving of our gratitude and praise are those outstanding members of the FAA's ATC team in New York who handled Flight 1549 on January 15th. We've all heard the recordings from that day. The skill and professionalism of the controllers who responded to the emergency is most impressive and much appreciated. We were pleased to learn that Air Traffic Control Specialist Patrick Harten is here today and will testify on the panel with our five crew members from Flight 1549. To my knowledge, this will be the first time the crew has met face to face with the gentleman whose calm but urgent professionalism was captured in those compelling recordings.

The successful outcome of this event can certainly be attributed to the superior performance of the entire crew, the passengers, ferry boat operators, emergency responders, and Air Traffic Control. But it also reflects the ongoing and collaborative efforts of US Airways and the FAA in the development of effective Flight and InFlight training programs. We can always learn more, of course, and

US Airways is working closely with the NTSB in its investigation of this successful ditching to further ensure a positive outcome if a similar emergency were ever to occur in the future.

Mr. Chairman, I am filled with pride because of the quick and heroic actions of our crew. They are here before you today. Their names are:

Captain Chesley Sullenberger
Age 58, joined US Airways (PSA Airlines) in 1980. He has a total of 19,700 flights hours

First officer Jeffrey Skiles
Age 49, joined US Airways (USAir) in 1986. He has a total of 20,196 flight hours.

Flight attendant, Sheila Dail
Age 57, joined US Airways (Piedmont Airlines) in 1980 and has more than 28 years experience with the airline.

Flight attendant, Donna Dent
Age 51, joined US Airways (Piedmont Airlines) in 1982 and has more than 26 years experience with the airline.

Flight attendant, Doreen Welsh
Age 58, joined US Airways (Allegheny Airlines) in 1970 and has more than 38 years experience with the airline.

We are happy to respond to questions or to provide additional information you may require from any of us at US Airways. Thank you.

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