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.