ASSOCIATION OF FLIGHT ATTENDANTS - CWA, AFL-CIO
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January 15, 2010

Mr. Robert Benzon
Investigator-in-Charge
Major Investigations Division
National Transportation Safety Board
AS-10, Room 5424
490 L'Enfant Plaza SW
Washington, DC 20594-0003

Dear Mr. Benzon:

In accordance with the National Transportation Safety Board's (NTSB) Accident/Incident Investigation Procedures, the Association of Flight Attendants-CWA, AFL-CIO (AFA) is submitting the following safety recommendations for the NTSB's consideration regarding the January 15, 2009 accident involving US Airways flight 1549.

Following take off from New York City's La Guardia Airport (LGA) US Airways flight 1549, an Airbus A-320-241, registered N106US, struck a flock of Canada geese and ingested them into both engines causing a loss of engine thrust resulting in a ditching in the Hudson River. The 150 passengers and 5 crewmembers were able to evacuate the aircraft successfully. There were no fatalities and one flight attendant and four passenger serious injuries.

The AFA appreciates the opportunity to be a party to the investigation and trusts that the NTSB will find our safety recommendations to be of assistance as the Board concludes its investigation.

Please feel free to contact me if you have any questions regarding the AFA submission.

Sincerely,

Candace K. Kolander
AFA Party Coordinator US Airways flight 1549
Coordinator, Air Safety, Health and Security

SUBMISSION FROM
THE ASSOCIATION OF FLIGHT ATTENDANTS-CWA, AFL-CIO
TO THE NATIONAL TRANSPORTATION SAFETY BOARD
REGARDING THE US AIRWAYS FLIGHT 1549 ACCIDENT
ON JANUARY 15TH 2009

There has been much discussion regarding whether the US Airways flight 1549 accident was a ditching or a forced landing on water, and if indeed it was a ditching, whether it was planned or unplanned. Strictly from a flight attendant perspective, however, these arguments are irrelevant. In fact, crash landings or ditchings and subsequent evacuations present unique and complex circumstances and scenarios, not all of which can be fully anticipated, trained or reviewed. Therefore, emergency training for airplane crewmembers must focus on one of two basic scenarios: landings or crashes that occur on either land or on water. Pilots and flight attendants are given annual training in these two scenarios in order to ensure the survivability of passengers.

The objectives of the federal aviation regulations and aircraft certification process are to ensure safety, airworthiness and crash survivability, through the development of appropriate procedures, training, equipment and structural design. It is our understanding that the certification regulations do not specifically differentiate between planned or unplanned landings – they reference only aircraft safety and survivability. For example, the requirements for design of airplane structures to withstand a ditching are addressed in 14 CFR part 25. Some of the ditching equipment requirements are also included in this part of the regulations. Nowhere, however, do these design regulations differentiate between planned or unplanned; they are intended to ensure protection in a ditching by maintaining of structural integrity and provisioning of appropriate equipment.

Therefore any landing in water, either planned or unplanned, is a ditching for the purposes of flight attendant emergency response. In a ditching, flight attendants should respond using all available emergency equipment that is onboard the airplane. It is irrelevant to the flight attendant whether the ditching was planned or unplanned; the response will be the same—attempt to use all the ditching equipment available to ensure the safety of passengers. We are therefore basing our comments on our belief that the US Airways flight 1549 accident was a ditching from the standpoint of cabin emergency response.

Aircraft Certification Standards for Ditching (14 CFR § 25.801)

The A320 was type certificated by the FAA on December 15, 1988[1]. According to the manufacturer Airbus, if this type aircraft is landed using certain assumptions of flight and approach, all doors will be available for evacuation. In reviewing the flight 1549 accident documentation it appears that the flight profile characteristics for this flight are not exactly as specified for the ditching certification of the aircraft, but they are reasonably close. At the public

[1] NTSB Accident DCA09MA026, Docket SA-532, Survival Factors Group Chairman's Factual Report, page 185.

hearing (June 9-11, 2009, Washington, DC) it became apparent that the assumed flight characteristics in relation to a ditching may not be realistic or attainable.

AFA recommends to the FAA:
The FAA should review the ditching certification requirements for the A320 flight profile characteristics to ensure they are reasonable and attainable.

Exit Availability in a Ditching – Aft Doors

The AFA has concerns regarding certification of the available exits for a ditching. The guidance Airbus provides to the air carrier, which is then relayed to the flight attendants, maintains that in an A320 ditching in all probability the four floor level exits will be available and the overwing exits are not to be utilized. The facts of the flight 1549 accident suggest that the approved certification of this aircraft with respect to the aft doors being available for use in the ditching scenario is flawed, especially if the recommended flight profile characteristics during a ditching are unreasonable or unattainable. If the aviation regulators and Airbus cannot reasonably expect that the flight characteristics as currently certified are attainable under the ditching scenario, we must assume that a similar situation will occur again; i.e., the aft exits will not be available.

This raises two concerns with respect to the exits on this aircraft in a ditching. First, the aft exits will not be available for use as proposed in the approved certification of this aircraft. Second, the overwing exits will be used during a ditching, whether or not they are approved for use in that situation.

AFA recommends to the FAA and Airbus:
The current certification approval based on the aft exits of the A320 being available in a ditching situation should be reviewed and re-evaluated to more accurately account for the probable, realistic behavior of the aircraft in water as occurred during the flight 1549 accident. The FAA should also review and assess the current flotation equipment levels on this aircraft type in the event that the aft doors are not available in a ditching.

Exit Availability in a Ditching – Overwing Exits

With respect to our second concern, it is apparent that the certification requirements did not match the actions and/or behaviors of the passengers in this accident. Specifically, the overwing passengers opened the exits almost immediately after the impact. They did not wait for a command from the cabin crew. Instead, these passengers instinctively opened the overwing exits as soon the aircraft came to a stop in the water.

In 1990, the FAA issued a final rule listing requirements for passengers seated in the emergency exit rows, to improve the odds of survivability in an accident. The FAA required that an airline allow only passengers able to perform the required safety functions in an emergency situation to sit in those seats. Anyone flying and seated in an exit row is no doubt familiar with these requirements, as well as the briefing given by flight attendants to those seated in the exit rows.

Among the requirements is an assessment of the exit row passengers to determine whether they are physically capable of opening and removing the emergency exit door, whether they are over the minimum required age of 15, and whether they are able to read and understand the instructions regarding evacuation procedures and understand commands in the English language.

Flight 1549 exit row passenger statements[2] indicate that after the ditching the overwing exits were opened almost immediately after the aircraft came to a stop. This behavior appears consistent with the behavior expected of any normal exit row passenger. Other accident investigations have documented that passengers seated at the exit row consistently open the exits in an emergency. In fact, most carriers now discuss the topic of "passenger initiated evacuations" or "unwarranted passenger evacuations" during flight attendant recurrent trainings to address this "self help" behavior of passengers. This behavior can also result in exit row passengers opening the exits before receiving any commands from flight attendants. It should therefore be anticipated that in an emergency event, like a ditching, exit row passengers will in fact open the doors they are seated next to on the airplane regardless of the commands or information provided them by the flight attendants.

Ditching certification requirements should therefore assume that all exits on an aircraft will likely be opened upon impact and stopping, unless damaged or otherwise egregiously unavailable. The certification requirements should require that all equipment available at these exits be intuitive and easy to use. In the situation of US Airways flight 1549 multiple passengers thought that the overwing slide was in fact a "flotation device" similar to a raft and thought it would disconnect from the aircraft similar to other slide/rafts located at doors. While the slide provided protection from the harsh elements of the cold water, the slide was not actually designed or intended for that use.

AFA recommends to the FAA and Airbus:
The FAA and Airbus should review and reevaluate the design of the overwing slide on the A320. The overwing slide should be redesigned to be detachable in a ditching, as past incidents have shown that passengers will likely open exits they are sitting next to in an emergency, and will also assume that the slide is a flotation device, whether or not it is certified for such use.

Flights Over Bodies of Water

The March 1996 FAA report "Transport Water Impact and Ditching Performance" states:

> "According to Boeing's worldwide operations summary, 69.1 percent of all accidents occur during the flight phases within close proximity to the airport, specifically takeoff, initial climb, final approach, and landing. It is important to note that these phases make up only 6 percent of the total flight time. Based on these statistics, flight having their takeoff, initial climb, and approach phases occurring over significant bodies of water should be adequately equipped to deal with water impact accidents."[3]

[2] NTSB Accident DCA09MA026, Docket SA-532, Survival Factors Group Chairman's Factual Report, pages 59-71.
[3] NTSB Accident DCA09MA026, Docket SA-532, Exhibit 6-N, p.33.

The majority of accidents for the worldwide commercial jet fleet continue to occur near airports. A recently published Boeing summary shows that from 1999 through 2008, 56% of fatal accidents occurred during the four flight phases in close proximity to airports, i.e., takeoff, initial climb, final approach and landing.[4]

The 1996 FAA report also states that 75.8% out of 256 airports studied at the time were found to have at least one or more overwater approaches. Yet only airplanes certified for Extended Overwater Operations (EOW) are required to carry life-saving equipment to help protect the occupants from water evacuations. Current EOW regulations, or ditching certification and equipment requirements, assume that accidents into the water will occur a significant distance from the airport. Yet the data show that the majority of accidents occur near airports, and that three of four airports have overwater approaches. Therefore, it is clear that all operations, not just EOW, should take into account the possibility of water evacuations.

US Airways flight 1549 was not scheduled for an EOW operation even though the airplane carried EOW emergency equipment. The accident A320 was EOW equipped, with passenger life vests at every seat for passenger flotation, infant life vests, seat cushions for additional passenger flotation, detachable slides that also act as rafts to keep passengers out of the water, emergency locator transmitters for emergency frequency signaling to rescue operations, survival kits for rafts, and lifelines at the overwing exits. Yet none of that equipment was actually required for that particular flight. Had flight 1549 been scheduled on a non-EOW equipped aircraft we would likely have seen a very different sort of emergency landing, evacuation and rescue.

Not all ditchings are going to have the quick water rescue response that we saw with US Airways flight 1549. A delayed response will increase the problems faced by ditching survivors, so it is imperative that factors be considered that can improve the likelihood of survival. One key component in water survival is to ensure that a person be kept from drowning by proper use of a functioning individual flotation device. Another key component is to keep people out of the water to combat the potential threat of hypothermia, which may occur in water as warm as 70°F during sustained immersion. Other factors that can influence hypothermia are age, physical attributes (gender, body fat content, etc.) and health of an individual. Group flotation is also important for survival, especially if one or more passengers sustained any type of injury during the ditching.

AFA recommends to the FAA:
The FAA should amend 14 CFR part 121 to require that all passenger carrying aircraft operating under this part be equipped with all the pieces of emergency equipment required for extended overwater operations as specified in 14 CFR 121.339.

[4] *Statistical Summary of Commercial Jet Airplane Accidents Worldwide Operations 1959 - 2008*, Aviation Safety, Boeing Commercial Airplanes, Seattle, Washington, July 2009, p. 22.
http://www.boeing.com/news/techissues/pdf/statsum.pdf

EOW and Non-EOW Aircraft Differences Should be Obvious to Flight Attendants

US Airways currently maintains a mixed fleet of aircraft with respect to equipment required for Extended Overwater (EOW) operations. According to the NTSB Survival Factors Group Chairman's Report there are 20 EOW A320s and 55 Non-EOW A320s in the US Airways fleet. Captain Sullenberger stated at the Public Hearing that it is obvious to US Airways pilots whether an airplane is an EOW or a non-EOW airplane, as this information is clearly stated on the cover of the aircraft maintenance log. The flight attendants however are not provided this information so clearly. According to US Airways Director of Inflight Training, Policies and Procedures, Mr. Ropert Hemphill, the flight attendants might only "discover" that they are on an EOW aircraft after they begin their check of emergency equipment. The US Airways flight attendant Inflight Emergency Manual (IEM) states that it is the responsibility of the "A" flight attendant to ensure that emergency equipment is checked, or delegates the responsibility of checking the emergency equipment to another flight attendant. This practice could result in one or more flight attendants on a particular flight not being assigned an emergency equipment check responsibility, leaving those flight attendants unaware that they are on an EOW equipped airplane. Clearly designated roles for emergency equipment checks by flight attendants are not stated at US Airways, creating a deficient situation.

AFA Recommends to US Airways:
All EOW equipped airplanes in the US Airways fleet should be designated as such with a clearly visible placard posted in the forward entry section of each airplane.

Passenger Briefings

Current regulation 14 CFR 121.133 requires that passengers receive a briefing and a demonstration of oxygen-dispensing equipment if a flight is being conducted above flight level 250. The standard passenger briefing requirements are included in 14 CFR 121.571 and require that passengers be briefed prior to takeoff on smoking issues, location of emergency exits and the use of safety belts. In addition, if emergency flotation equipment is required the location and use of such equipment must be briefed. EOW operations also require a demonstration of the donning and inflation of the life preserver under 14 CFR 121.573.

FAA Advisory Circular, Passenger Safety Information Briefing and Briefing Cards, AC No. 121-24C, dated 7/23/03 states:

> "An alert, knowledgeable person has a much better chance of surviving any life- or injury-threatening situation that could occur during passenger-carrying operations in civil aviation. Therefore, the Federal Aviation Administration (FAA) requires a passenger information system for U.S. air carriers and commercial operators that includes both oral briefings and briefing cards."

Information can make the difference between life and death in certain situations. Only flights that are required to carry specific additional emergency equipment, such as EOW flights, are required to brief and demonstrate that equipment. An air carrier could choose to carry additional

emergency equipment such as flotation equipment onboard their aircraft, even though the equipment is not required for that specific flight; however, according to the FAA they would not be required to inform the passenger regarding the availability of such equipment. Given the lessons of US Airways flight 1549, it appears that this may not be in the best interests of aviation safety.

If emergency equipment that could be used by a passenger during an emergency situation is present onboard an aircraft, the passenger should be made aware of the equipment to help ensure "a much better chance of surviving."[5] Currently the FAA only "recommends" to air carriers that passengers be informed of emergency equipment carried on aircraft if the equipment is not required for that particular flight operation. If there is additional safety equipment onboard an aircraft that can be utilized by passengers in an emergency situation, the air carrier should be required to inform passengers about the equipment. Depending on the complexity of use and relative importance to survival of certain equipment items, for example life preservers, the air carrier should also be required to provide appropriate pre-flight demonstrations.

AFA Recommends to the FAA:
The FAA should amend the relevant sections of 14 CFR parts 91, 121, 125 and 135 to require that all pre-departure briefings include information on all emergency equipment that could be utilized by passengers. The FAA should also amend the relevant sections of 14 CFR parts 91, 121, 125 and 135 to require that all pre-departure briefings include a demonstration of the flotation equipment carried on the aircraft.

Lifelines

Certification requirements require that lifelines be installed onboard EOW airplanes. The accident A320 was equipped with lifelines stowed in overhead bins near the overwing exits on both the left and right sides. The regulatory purpose of the lifelines is to allow occupants to stay on the wing after a ditching. US Airways flight attendant training documents state the procedure for the lifeline is for a flight attendant to remove it from the designated stowage location, attach it to the exit frame and then attach the other end to an eyelet on the wing. There are several issues or concerns relative to this piece of emergency equipment. The training and procedures at US Airways assume that the lifeline will be used by the flight attendants when they get to the overwing exits; however, at this carrier, the overwing exit on the A320 is designated as an unusable exit in a ditching. Therefore, had any time actually been available for a briefing to overwing passengers prior to impact they would have been told they should not utilize the overwing exits; which means that passengers would not have been briefed on the use of the lifeline. This observation is supported by a review of the emergency briefing card, which does not depict the lifeline in any of the diagrams. At US Airways it appears that there is no foreseeable use for the lifeline, if in fact it is only for use by a flight attendant. The use is again further limited due to the fact that by the time the flight attendant gets to the overwing exit in a ditching situation the passengers may have already exercised self-help and would likely already be out on the wing. The wing would likely already be covered in water making it almost impossible to locate the eyelet on the wing in which the lifeline is to be attached.

[5] FAA AC No: 121-24C

AFA recommends to the FAA:
The FAA should review the requirements for the lifeline and assess its necessity if it has no practical use in a ditching situation. Additionally, if lifelines are to be used, the FAA should review carrier training plans and curricula to ensure consistent and appropriate guidance and training are provided on their use.

AFA recommends to US Airways:
US Airways should review their training plans, inflight emergency manuals, and policies and procedures regarding how lifelines will be realistically used in a ditching situation, the limitations of their use, and whether any alternate methods of use are appropriate depending on various ditching situations.

Hands-on Training

During the investigation into the US Airways flight 1549 accident it became apparent that the crewmembers had difficulty releasing the slide/raft from the aircraft during the evacuation. They also had difficulty finding the knife attached to the slide/raft that is used to cut the mooring line attaching the slide/raft to the aircraft.

Although the overall outcome of the evacuation was a success, these problems indicate some deficiencies in the approved training program relative to emergency drills. The FAA training regulations require hands-on training on certain pieces of equipment so that the user will be able to feel the "forces and actions" necessary to operate the piece of equipment in an emergency situation. A post-accident statement by one of the crewmembers mentioned that the use of the quick release handle was not as easy as she had expected.

Air carriers use mock-ups to provide realistic training during emergency drills. These devices are part of the FAA-approved training programs for flight attendants. However hands-on training for the "For Ditching Only Flap," the "Quick Release Handle," and the "Raft Knife" components of the slide/raft are not required. The FAA only requires that crewmembers know the locations, operation and functions of each device. As a result, the US Airways Recurrent Training curriculum for the dry ditch drill does not include hands-on training.[6] The dry ditch instructor guide states that instructors should "take entire class to the slide/raft station and have them stand along the girt bar end and one side of the slide/raft." The instructor is then to "show" the components of the A320 slide/raft, including the three pieces of equipment listed above. It is not until the instructor "displays" the ELT that the flight attendants actually enter the slide/raft one at a time. It seems reasonable to expect that not being in the slide/raft when discussing the locations of attached emergency equipment may lead to a lack of situational awareness during an actual emergency situation.

The visibility of the quick release handle during actual emergency situations is a further concern. The Technical Standard Order (TSO-C69c), Emergency Evacuation Slides, Ramps, Ramp/Slides, and Slide/Rafts requires that the manual inflation handle be red in color, marked with the word pull (or other appropriate instruction), with the word lettered in a high visibility, reflective, contrasting color and at least 1/2-inch high. This use of contrasting coloring and

[6] NTSB Accident DCA09MA026, Docket SA-532, Exhibit 6-D.

wording creates a highly visible device to aircraft occupants. In reality, the slide/rafts on US Airways are of a gray color, the ditching flap is of a similar color to the entire raft, and the quick release handle, which the TSO says should be a "readily apparent flexible cloth/webbing loop," is also of a similar color tone.

AFA recommends to the FAA:
The FAA should amend the relevant current training sections of 14 CFR 91, 121, 125 and 135 to require a hands-on drill to simulate the forces and actions of the components of slide/rafts, specifically the use of the "For Ditching Only Flaps" and the "Quick Release Handles." Additionally, the FAA should require operators when conducting training exercises to ensure that crewmembers are in actual locations that would mimic where the crewmember might be located when actually using the piece of emergency equipment.

The FAA should amend TSO-C69c to require that the disconnect device, or quick release handle, be designed to create a more visible device.

AFA recommends to US Airways:
US Airways should review and modify the current training to ensure that crewmembers are in the actual locations that would mimic where the crewmember might be located when the actually using the piece of equipment. With respect to lessons learned from the US Airways flight 1549 accident, flight attendants should be required to board the slide/raft before the instructor shows the students the components of the A320 slide/raft.

Wet Ditch Drill Requirement and Improved Recurrent Training

Immediate actions by crewmembers in an evacuation can improve the odds of survival for all occupants of an aircraft. One way to ensure quicker, more decisive action is through the use of performance drills. The FAA in their 2009 NPRM on training rules, recognized the benefits of performance drills as they relate to effective emergency response by proposing[7] an increase in the frequency of performance drills from the current 24-month cycle to a 12-month cycle. The NPRM also emphasizes ditching drills for flight attendants in particular, a one-time required ditching survival drill in a wet training environment. AFA believes that this is a step in the right direction.

AFA recommends to the FAA:
The FAA should amend the current and proposed emergency training sections to require flight attendants be given hands-on wet training drills during their new-hire emergency training and periodic hands-on wet training thereafter.

[7] Docket No. FAA–2008–0677; Notice No. 08–07; Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers

Slide/Raft Transfer

Ditching certification requirements state that sufficient quantities of "liferafts" be onboard the aircraft to accommodate the maximum number of occupants for which the aircraft is being certified.[8] Regulations also require that, in the event of loss of one liferaft of the largest rated capacity, the remaining liferafts will be sufficient to accommodate all the occupants. The regulations also state that the liferaft must allow for rapid detachment and removal for use at other than the intended exits. As technologies and designs have improved, the emergency evacuation slides located on the doors have been reengineered to be slide/rafts. These slide/rafts replaced the older liferafts that might have been stored in overhead bins near the intended use exit. This allowed for more overhead storage space for passenger items and also reduced the weight of the aircraft since one piece of equipment could now serve a dual purpose—a slide and a raft when necessary.

For certification purposes, slide/rafts must accommodate all the occupants assuming the loss of one and they must be portable. The FAA acknowledged both of these requirements at the public hearing; yet the FAA also stated that they do not require or expect an air carrier to demonstrate portability. This is simply a manufacturer-demonstrated certification exercise to show compliance with the regulation for portability and occupant capacity.

On January 12, 2009, the FAA published a Notice of Proposed Rulemaking (NPRM)[9] regarding proposed changes to the training requirements for pilots, flight attendants and dispatchers. One of the proposed changes was the deletion of the requirement for knowledge training on slide and raft transfer as well as the observation of the procedure. AFA participated on the Aviation Rulemaking Committee (ARC) tasked with working (with the FAA and other aviation industry representatives) on the proposed changes. AFA believes that the issue of slide/raft portability in general should be reviewed in light of the ditching of US Airways flight 1549.

AFA recommends to the FAA and Airbus:
If in fact raft portability is required for aircraft certification, the FAA and Airbus should consider developing slide/raft requirements that ensure intuitive transfer procedures, a reduction in the number of steps to remove the slide/raft from the unusable door, and better designs that ensure the slide/raft does not deploy during the process of transferring the slide/raft to another usable door.

AFA recommends to the FAA:
If slide/raft portability cannot be realistically demonstrated by the air carrier, the FAA should review existing certification requirements. The FAA should also review the adequacy of slide/raft capacities if the loss of one door could create a situation where adequate capacity for the occupants of the aircraft cannot be met if the slide/raft cannot be transferred, in which case, the FAA should require the installation of alternate flotation devices, such as a portable raft stowed in the cabin, to accommodate the occupant capacity in a ditching.

[8] 14 CFR 24.1411(d)(4)
[9] Docket No. FAA–2008–0677; Notice No. 08–07; Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers

If the FAA determines that slide/raft transfer is realistic, the FAA should require that air carriers demonstrate the ability of the crew to accomplish the transfer. Additionally, the FAA should reconsider the proposed removal of the training requirement for slide/raft transfer in Docket No. FAA–2008–0677; Notice No. 08–07; Qualification, Service, and Use of Crewmembers and Aircraft Dispatchers.