

# *in the* Drink

**Thorough ditching training is not mandated for U.S. civilian airplane crews, but some specialists envision benefits from simulator exercises.**

BY ROBERT W. MOORMAN

Ditching is the short term for an intentional and controlled emergency landing on water. Interest in what the flight crew and cabin crew of an airliner should do before and after ditching resurfaced at the U.S. National Transportation Safety Board (NTSB) June 9–10 public hearing on the widely reported mid-January 2009 ditching of US Airways Flight 1549, in which all occupants of the Airbus A320 survived.

It remains to be seen whether NTSB will recommend that the U.S. Federal Aviation Administration (FAA) mandate specific ditching

training beyond what is now required by U.S. Federal Aviation Regulations (FARs). Basically, pilots of all large and turbine-powered multi-engine airplanes currently must only be familiar with the emergency equipment aboard the airplane such as life vests and life rafts; no specific ditching training is required. For crewmembers engaged in fractional ownership, on-demand, commuter and air carrier operations, there must be instruction on the use of ditching equipment and in the performance of ditching procedures, as well as ditching drills or demonstrations.<sup>1</sup>

Several training organizations provide post-ditching training, but pre-ditching simulator training for U.S. commercial airline pilots appears to be nonexistent. Several air carriers contacted said they practice elements of a ditching scenario but not the ditching maneuver itself. “There are several reasons for this, the most relevant being that there is no commercial simulation available for a realistic sea surface, particularly the swells and the firmness of the water surface,” said Bill Johnson, director of flight training for Alaska Airlines. “In other words, simulators simulate ground contact, not water

[contact], and any training to touchdown would actually be negative training.”

CAE, a provider of simulators and training solutions, offers “theoretical procedures” for ditching large commercial jets, but the simulation software available only takes the flight crew to the “point of contact with the water,” said CAE spokesman Chris Stellwag.

Alteon, a unit of The Boeing Co., does not offer specific ditching training for pilots but provides emergency procedures training, the company said.

Johnson said that Alaska Airlines trains its pilots for specific emergencies that might force them to ditch. For example, the airline’s recurrent training updates for 2010, introduced in January, involve losing thrust from both engines because of volcanic ash and obtaining maximum glide performance while attempting to relight the engines.

Some airlines review ditching procedures and the related flying techniques and principles in the classroom. “Basically, it comes down to a few things pilots need to remember,” said Tom Hull, Alaska’s flight operations instructor, “such as 10-degree to 12-degree nose-up attitude before touchdown, notifying the cabin crew of

what’s going on, and maintaining level flight as well as a low descent rate.”

Techniques and procedures are recommended. “You have to consider the direction in which the swells are going,” said Jennifer Ewald, a first officer for American Airlines and spokeswoman for the Allied Pilots Association. That point was emphasized in a 660-page special report on overwater operations safety published in 2004 by Flight Safety Foundation. The report included a detailed discussion of ditching procedures and considerations, concluding that the primary consideration is: *Don’t land into the face of a swell.*<sup>2</sup>

Another recommendation for ditching preparation, said Ewald, is to closely follow the drift-down charts, which are unique to each aircraft. The charts tell what power setting to use to conserve fuel — if any power is still available — as well as the correct angle-of-attack. Weight of the aircraft, altitude and outside air temperature are all factored into extending the glide path of the aircraft.

### Unified Approach

Specific ditching training for airline flight attendants and cabin instructors in recent years has dealt with evacuation and survival. But lately, pilots also have been participating in special programs independent of the initial and recurrent training requirements for flight crew — sometimes participating in new-hire training of flight attendants.

Condor Airlines, a German charter airline, for several years had offered post-ditching and survival training only for cabin crew in conjunction with the German navy. The training program now includes pilots. “We changed the program to add the pilots and to include aspects of handling the aircraft prior to ditching, as well as to improve communication among the crew,” said Condor’s Dietrich Langhof, a captain and flight safety and security standards manager who leads the three-day course. Condor inserted two chapters on ditching in its safety manuals, and the information is discussed during the course.



Ditching training for Condor Airlines crewmembers includes open water (above) and simulator experience.

The extended operations (ETOPS) pilot training given every two years by Condor’s training department also simulates a double engine failure, but the flight crew does not conduct a simulated water landing. Nevertheless, the three-day course and the separate ETOPS training go a long way to “changing the mindset of the pilots to a belief that ditching a commercial airliner in the ocean is survivable,” Langhof said.

On the first day of Condor’s three-day course, students arrive in Cuxhaven on the northern coast of Germany for an introduction and training materials. Day two consists of classroom and swimming pool training at the German naval air wing in nearby Nordholtz. Classroom topics include a “cold can kill” segment covering hypothermia, search and rescue (SAR) procedures, theory of survival, and a presentation on leading and organizing SAR operations. Students learn to use survival equipment, including how to fire flare guns.

In the afternoon, students go to the pool, where they learn the general principles of egress from a submerged aircraft. They are taught to maneuver in the water while wearing a cumbersome helicopter crewmember helmet and life vest, as well as how to delay the onset of hypothermia. This type of survival training covers techniques such as the heat-escape-lessering posture (HELP). To assume the HELP position, students wearing a life vest cross the inner sides of their arms against their chest, hold their thighs together and raise their legs to protect the groin area from the cold.

Early in the morning of day three, students board a German navy ship near Hamburg for open-sea training. They wear immersion suits to enable them to safely experience immersion in the North

Sea and to board the type of 46-person life raft carried on airliners used in overwater operations. Afterward, they are “rescued” by a boat or helicopter.

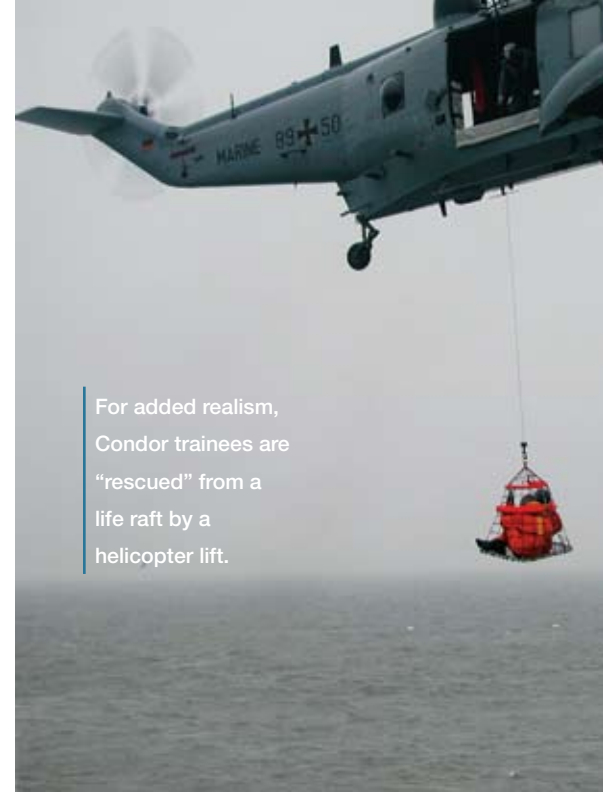
Since 2002, Condor has conducted the ditching and survival course for its flight crews and those of several other airlines, including British Airways and Hawaiian Airlines. As to flight simulator training for ditching: “It’s hard to find anything,” Langhof said. “Many airlines have a ditching checklist, but there is often no time set aside to practice in a simulator.”

Langhof said he is disappointed, but not surprised, that there has not been an increase in ditching training for pilots over the years. If the Air Transat A330 had been ditched in the ocean, rather than landed powerless at an island airbase, in August 2001, “I guarantee we would have seen changes in the regulations,” he said.

The crew of Air Transat Flight 236 glided 85 nm (157 km) to a landing in the Azores after both engines flamed out over the Atlantic. The A330, en route to Lisbon, Portugal, from Toronto, had developed a leak in the fuel line of the right engine. When the pilots noticed a fuel imbalance, they opened a crossfeed valve to transfer fuel from the left tank to the right tank. The procedure compounded the problem, however, and fuel exhaustion resulted.

The incident prompted the French Direction Générale de l’Aviation Civile and the FAA to issue an airworthiness directive requiring operators of specific Airbus models to revise their flight manuals to direct flight crews to check if a fuel imbalance is due to a leak before opening the crossfeed valve.

Air Transat said that it has offered post-ditching training since the company’s inception in 1987. However,



For added realism, Condor trainees are “rescued” from a life raft by a helicopter lift.

the airline does not offer pre-ditching simulator training for pilots.

Langhof and other trainers believe that pre- and post-ditching training might have helped the flight crew of Tuninter Flight 1153, an ATR 72 that crashed in the ocean off the coast of Sicily after running out of fuel in August 2005 (p. 26). Langhof said that the cockpit voice recording indicated a lack of coordination and ditching preparation by the flight crew.<sup>3</sup>

### Training Needed?

The rarity of a large commercial jet ditching has been another reason why flight crew simulator training for such an event is not a high priority for airlines. “One of the reasons there has been foot-dragging on this issue is that there has been only a handful of [air carrier] aircraft in the last 50 years that have actually ditched,” Alaska’s Hull said.

During its research on overwater operations safety, the Foundation identified from available data from Jan. 1, 1976, to July 8, 2003, nearly 500 ditching accidents worldwide involving airplanes ranging from small piston

singles to large multi-engine transports.<sup>4</sup> The bottom line, according to the Foundation's special report, is: "Believing that a ditching can't happen or won't happen is not supported by data."

Had the ditching of US Airways Flight 1549 ended badly, there likely would be a clarion call for ditching-related simulator training, said Hull and other trainers.

Nevertheless, ditching training is getting renewed attention from academia as a result of that event. "Many pilot training centers and university aviation programs are rethinking how they might add or improve ditching training in their curricula," said Richard Fanjoy, associate head for graduate education in the Department of Aviation Technology at Purdue University.

Fanjoy is among those who agree with Alaska's Johnson that simulator limitations have precluded such revisions. "Unfortunately, the visual and motion aspects of modern flight simulators just do not do a good job of realistically presenting a ditching flight condition," said Fanjoy.

The lack of software to adequately simulate ditching in fixed-wing aircraft is the main problem. "[Unlike] helicopter training for offshore operators, there is nothing [suitable] in the fixed-wing world," said Rick Bedard, director of training operations for FlightSafety International (FSI). Since the Flight 1549 accident, however,

several of FSI's customers have asked about getting specific ditching training for fixed-wing aircraft, Bedard said.

New requirements for ditching training might be adopted by the FAA, which has proposed revisions of FARs Part 121 training requirements in Subparts N and O (ASW, 4/09, p. 39). The notice of proposed rule making (NPRM) includes performance training on survival equipment, both wet and dry, and other training events. It also proposes emergency procedures training and an observation drill on the deployment, inflation and detachment of evacuation slide-rafts.

The proposed performance standards are appropriate to each crewmember's task in the ditching, and the frequency requirements for recurrent training are different for pilots and flight attendants. The NPRM notably does not propose flight simulator training on ditching; it refers only to emergency procedures and preparing the aircraft for ditching — training that already is offered by many airlines.

The NTSB investigation of the Flight 1549 accident may or may not contain specific new recommendations for ditching training of flight crew and cabin crew. But the ditching of the A320 on the Hudson River by Capt. Chesley Sullenberger and First Officer Jeffrey Skiles, and the evacuation organized by the cabin crew, could yield new best practices.

"We are looking at using as much as we can from US Airways Flight 1549 [for classroom training] because it was a great example for everyone," said Alaska's Hull. ➔

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## Notes

1. U.S. FARs Part 91.505, 91.1083, 135.331 and 121.417.
2. FSF Editorial Staff. "Waterproof Flight Operations." *Flight Safety Digest* Volume 22 and 23 (September 2003–February 2004).
3. A portion of the cockpit voice recorder recording has been published on the Internet by YouTube at <[youtube.com/watch?v=rVPv\\_mrU95w](http://youtube.com/watch?v=rVPv_mrU95w)>.
4. FSF Editorial Staff.

Passengers  
await rescue  
after evacuating  
US Airways  
Flight 1549.

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