

**G**rowing numbers of airline industry stakeholders are recognizing that key updates are needed in pilot training to keep basic flying skills from eroding further. And with loss-of-control accidents becoming an ever greater concern, those changes are not happening quickly enough.

The No. 1 cause of fatal accidents now is pilot loss of control, followed by controlled flight into terrain. The latter which has seen marked improvements in the past few years due to the introduction of technology such as the enhanced ground proximity warning system. More than 80% of all loss-of-control accidents are fatal, as was tragically illustrated by the crash of Air France Flight 447 into the Atlantic Ocean and the stall of Turkish Airlines Flight TK1951 on approach to Amsterdam, both in 2009.

The European Aviation Safety Agency (EASA) dedicated its annual airline safety congress here this month to the loss-of-control topic to highlight how urgently the industry needs to address it.

One theme dominated the conference: pilots are not being adequately trained

**The crash of a Turkish Airlines Boeing 737-800 on final approach to Amsterdam in March 2009 was attributed to loss of control. Nine passengers and crew were killed, including the three pilots.**

in the correct areas. Pilots continue to train in the simulator to react to the loss of one engine on takeoff or deal with a one-engine go-around. "Those hardly ever happen in the career of a typical airline pilot," says a senior training official at a major European airline. "But the industry is still trying to prepare for all sorts of mechanical failures."

The problem is not only that there are too many scenarios to prepare for; the real issue is in the area of psychology. "The competencies needed to cope with the unexpected in real time are those that are lost in a continuous effort to anticipate and respond to all potential threats in the system," says Jean Paries, president of Paris-based crew resource management consultancy Dedale. In his opinion, the industry should therefore move away from repeating what it considers to be possible scenarios in simulator training and focus much more on teaching pilots the resilience to deal with unexpected situations.

Paries referred to a 2008 study by French civil aviation authority DGAC called the Accompli project, which tested a group of copilots to observe their performance in several inflight scenarios. Most of them stated in the subsequent interviews that they felt comfortable in both routine and abnormal flying situations that were known to them from previous training. But they

and less uncertainty," says Paries. But he stresses that "things that have never happened happen all the time"—and those are the things that today's pilots are least trained to deal with.

The skills to cope with the unexpected are crucial in recovering loss-of-control incidents before they turn into accidents, Paries argues. These include the capability to make quick decisions as well as analyze what is possible and what crew and aircraft are unable to do. Pilots also have to be confident enough to move from "satisfying" decisions to "sacrificing" decisions that might have to be taken in spite of their potentially negative consequences. "We need to re-define the whole training perspective," Paries says. "We need a paradigm shift and crew resource management redesigned toward this shift to include the element of unpredictability."

Another important aspect in the loss-of-control debate is the danger of basic flying skills eroding during the course of a pilot's career. EASA Director General Patrick Goudou points out that "increased automation may lead to the loss of some pilot skills if mitigating measures are not taken." According to several senior pilots, airlines are slowly changing their attitudes. While for a long time pilots were advised to fly manually as little as possible, they are now encouraged to fly longer pieces of their sectors manually, particularly



the sequence after takeoff and a more extensive part of the approach.

Some carriers are even going a step further. Lufthansa CityLine, the group's regional affiliate, for example, opted not to equip its Embraer 195s with auto-land capability but fully relies on the head-up guidance system. One important reason for the decision was to keep pilots more current in their basic flying skills.

EASA's Safety Action Coordinator Michel Masson, too, is questioning whether the industry "could be going too far in automation." He observes that "basic [manual and cognitive] flying skills can decline because of lack of practice." That trend is particularly worrying as pilots are also having difficulty understanding

ous alarms. And in the Qantas Flight 32 uncontained engine failure on Nov. 4, 2010, one feature that attracted much attention inside the industry was the fact that pilots worked through a long list of failure messages for more than 2 hr. before they prepared to return to land in Singapore.

The experience of AF447 is already having a deep impact on procedures as far as stall recovery is concerned. Manufacturers including Boeing and Airbus have worked out a new template that pilots are to follow in the event of a stall or approach to stall. According to Boeing's chief pilot for regulatory affairs, Philip Adrian, the list is composed of six points. If an aircraft stalls, pilots should:

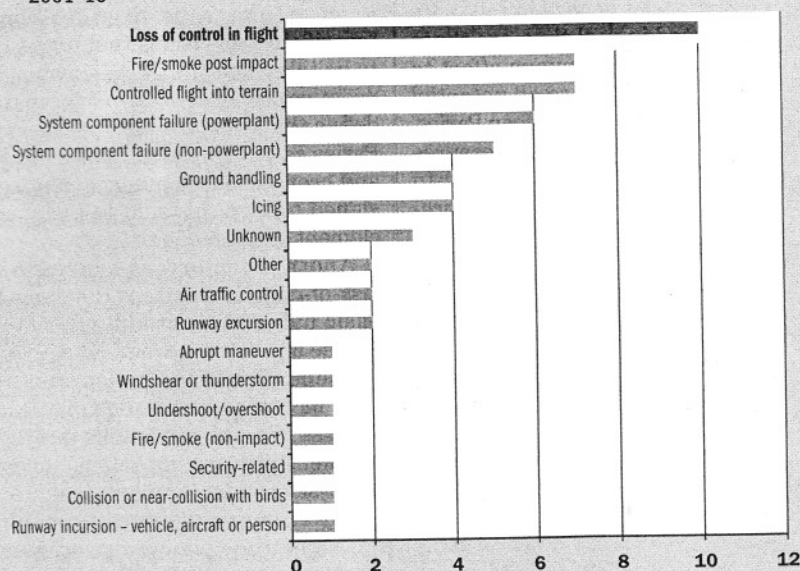
Claude Lelaie, says that an immediate reaction to a stall warning would be needed to avoid altitude loss. And he argues that even if a stall occurs in low altitude, "it is better to fly the aircraft into the ground than to stall." He cites the crew of a British Airways Boeing 777-200ER that managed to achieve a controlled impact with the ground after both engines failed on short final to London's Heathrow Airport in January 2008.

Adrian points out that manufacturers should find common procedures, given that pilots are frequently switching types. He also stresses that, following the successful recovery from a stall, many pilots are still lacking situational awareness. Thus, he recommends that pilots not simply return to their previously planned altitude but actively decide which flight path and altitude are adequate, given the circumstances.

In the aftermath of AF447, French air accident investigation authority BEA recommends the introduction of an angle-of-attack (AOA) indicator in the cockpit. However, Lelaie is cautious

## Fatal Accidents Involving Aircraft from EASA Countries

2001-10



Source: European Aviation Safety Agency "Annual Safety Review 2010"

what is going on when automation reaches its limits and multiple failures force pilots to regain manual control of the aircraft and the situation as a whole within a matter of seconds. Masson believes air crews are often spending too much

- Disconnect the autopilot to avoid fighting the automation.
- Disconnect the autothrust.
- Exert nose-down pitch inputs.
- Exert nose-down pitch trim, if needed.
- Keep the wings level so that all the lift

**Loss of control is by far the most severe accident category and improvement initiatives have to go deep into pilot training.**

about the proposal. He says stalls occur at greatly disparate AOA depending on altitude and that the stall warning itself is the strongest indicator of a wrong AOA. Any measurement devices would also have to be installed on the wing, because that is where the angle to the airflow should be measured, rather than on the side of the cockpit.

Another area of concern are go-arounds. As Bertrand de Courville, corporate safety manager at Air France and an Airbus A330/340 captain, puts it, many parameters change simultaneously in go-arounds, making the maneuver particularly challenging. At some airports, de Courville says published go-around procedures include altitudes that are too low. At New York John F. Kennedy Airport, go-around patterns are to be