

AVIATION WEEK

& SPACE TECHNOLOGY

Evidence of Progress

Using flight-recorder data from accidents and incidents could help civil pilots 'train as they fly'

GRAHAM WARWICK/WASHINGTON

A Boeing 737NG full-flight simulator in Texas is to be used to test whether actual flight-recorder data can be employed for improved pilot training. The U.S. military is fronting the research, but its results could have significant ramifications for civil aviation as it moves to training based on performance standards instead of prescriptive tasks.

The year-long trial is one of the first formal evaluations of the emerging concept of evidence-based training—using

Flight data animations from actual events could help train pilots to notice subtle human factors behind accidents/incidents.

objective flight data from aircraft accidents and events recorded by flight operations quality assurance (FOQA) programs to develop specific simulator scenarios that help pilots “train as they fly.”

Funded by the Defense Safety Oversight Council, the demonstration involves a simulator at CAE Simuflite's Dallas/Fort Worth center that is used to train crews for the C-40 military version of the 737NG. The trial is intended to validate whether simulator training based on real events is valuable to instructors and students.

“We'll take a real mishap and/or FOQA event with a safety value independent of the severity of the outcome and come up with a scenario to train against,” says Claude Lauzon, CAE vice president for civil aviation ser-

vices. “Then we'll ask the people we train whether they learned something. If it's favorable, we'll keep expanding the program.”

CAE is supporting a push by the International Air Transport Assn. to change the regulations governing simulator use to allow for evidence-based training. “Simulator training is focused on how to fly the aircraft and respond to emergencies. Prescriptive training for events such as engine failures is still valid, but they happen much less in

According to Mike Poole, CAE Flight-scape's chief investigator, there is a gap between simulator training and actual flying that could be closed using flight data. “The top problems we see in simulators are not related to the top problems we see causing aircraft accidents,” he says.

“In the simulator we see incorrect or out-of-sequence standard operating procedures and flight-management-system-programming or skill-based errors. In the aircraft



CAE FLIGHTSCAPE

modern aircraft,” he says. “We want to use objective flight data to develop explicit scenarios that attack the events threatening safety today.”

The Canadian simulator manufacturer's support for evidence-based training builds on its 2007 acquisition of flight data analysis specialist Flightscape, and in particular its animation tools for visualizing data from aircraft accidents and FOQA events. CAE has already incorporated Flightscape's software into simulator briefing and debriefing tools, but evidence-based training would take the flight data into the simulator itself.

we see complacency, inability to diagnose problems or circumventing trained procedures,” Poole says. “This is how the aircraft is being flown, and we can use that data to influence training.”

CAE Simuflite in October announced an agreement with a Fortune 100 company operating a fleet of Gulfstreams to collect flight recorder data from its aircraft, detect events exceeding prescribed parameters and develop training scenarios for its pilots.

The program will measure flight parameters against the operator's standard procedures to detect where pilots go beyond limits


on, for example, bank angle or descent rate, set for passenger comfort. Animation of the flight data on desktop computers will then be used as a training tool.

In addition to being used to develop simulator scenarios, flight data animations can help pilots understand the lessons from key accidents. A former accident investigator, Poole believes there are broad safety issues uncovered by investigations that are not being addressed in today's training. These often involve subtle human factors that are hard to communicate. "How do we get the

experience of an investigator into the average line pilot?" he asks, arguing that animation of the flight data from accidents and incidents is the key.

Training based on flight data is expected to augment, not replace, traditional simulator training. "We think there will be a mix," says Lauzon. "You still need to train for engine failures and other events, but in reality the frequency of training for such failures is overkill given today's engine reliability. The past schedule of training events has been outpaced by technology."

Flight data recorders were first used as accident investigation tools, but it was realized the data could be used to detect and correct problems in routine operations. Using the same data for training is the next evolution, argues Poole.

Another step is to use flight data from the simulator itself, Poole says. "The simulator is also a rich source of flight data. Don't throw it away. Collect the data and see if the way the simulator is being flown is the same way the aircraft is being flown." 



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