

'Automation addiction,' other airline flight issues could be mitigated by better user interface

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Amid news reports on the National Transportation Safety Board hearings regarding possible causes of the Asiana plane crash at San Francisco International Airport in July, questions have been raised about pilots' overreliance on or failure to understand cockpit automation and even whether pilots are sufficiently trained to fly without it. Eric Geiselman and colleagues propose that user interfaces that take advantage of avionics' underlying data and logic could enable pilots to better cope with extraordinary circumstances like the unavailability of an instrument landing system, as was the case in San Francisco.

In Geiselman et al.'s October *Ergonomics in Design* article, "Flight Deck Automation: A Call for Context-Aware Logic to Improve Safety," the authors describe prototype designs that could mitigate errors leading to accidents and incidences such as the A330 Air France Flight 447 crash in 2009 and the airport overfly of Northwest 188 that same year.

A Northwest 188 pilot programmed in an incorrect radio frequency early in the flight, cutting off communication with [air traffic control](#) and especially ATC's alert that the plane had missed the planned descent point by 150 miles. "Through a simple database comparison algorithm," the authors wrote, "the system can seek clarification when an erroneous frequency is selected . . . and issue an alert."

In the Air France 447 tragedy, a sensor malfunction caused the autopilot

and autothrust to disconnect, which unnecessarily caught the pilots off-guard and began a series of critical errors. Geiselman and colleagues also noted that invisible dual-control inputs, which enable both pilots to enter commands, basically (and by design) canceled out corrective actions attempted by the copilot. The authors developed a prototype concept for visually displaying the actions of both [pilots](#) and the aircraft so each pilot can be kept aware of all actions.

The article is intended "to offer a point of departure" for discussion about improvements to cockpit aviation among the design community.

Provided by Human Factors and Ergonomics Society

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