Beat: Technology

Dangerous flaw; in autopilot systems may cause planes to stall

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USPA News - A flaw that causes airplane autopilot systems to respond in a dangerous way when a plane is attempting a steeper than normal landing approach has been identified by Dutch investigators, according to a report published on Thursday, calling it a "significant threat" to aviation safety. The Dutch Safety Board said it became aware of the flaw after an incident at Eindhoven Airport in the Netherlands in May 2013. The agency later found that the incident was not an isolated event after it identified at least 23 similar incidents in recent years, four of them in Europe and 19 in the United States.

According to the investigation, the glitch is triggered when an aircraft using autopilot approaches the airport from a higher than usual altitude and aims to capture the 3-degrees glide slope, which is provided by the instrument landing system (ILS) at airports to guide the aircraft to the runway for a stable and safe landing. The ILS glide slope antennas transmit two radio signals to incoming aircraft, one being a "fly up" signal for below the 3-degrees glide slope and the other being a "fly down" signal for the area above the slope. When both signals are equally received by the aircraft, the systems know it is correctly positioned on the glide path to the runway. However, the investigation found that the antennas transmit a reversed false glide slope at an angle of 9 degrees, causing a potentially dangerous situation. When the autopilot captures the false glide slope, the aircraft will receive a "fly down" signal until the signal suddenly changes to a fast increasing "fly up." Once the sudden "fly up" signal is received, the autopilot pitches the nose up, causing the aircraft to climb while it loses airspeed. The resulting loss of airspeed may cause the aircraft to stall, in which case the wings lose so much of their lift that the plane risks falling from the sky. This is especially dangerous at a low altitude. "This phenomena was unknown to the aviation community and incorrectly described in aircraft manuals," the safety board said in a presentation. "This unexpected autopilot behavior is dangerous, in particular during the landing phase. It leaves the crew limited response time to disconnect the autopilot and recover the aircraft." ILS systems, used at all major airports around the world, are subject to regular signal inspections and certification, but the upper limit of the inspection area has an angle of 5.25 degrees. This means that all ILS signals above an angle of 5.25 degrees are outside the required inspection area. The Dutch investigation found the glitch always occurs at the 9 degrees glide slope and sometimes at the 6 degree glide slope. Based on these findings, the Dutch Safety Board issued a worldwide aviation Safety Alert in November 2013. In its public report published on Thursday, the safety board recommends that aircraft are prevented from flying in the area with reversed ILS signals. It also urged aviation authorities worldwide to alert pilots to the potential hazard and to include information about it in manuals and training programs.

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