TWO ATC AGENCIES 'BLACKLIST' 787 OVER POSITION-DATA FLAW

News / Airlines

Most of the **Boeing 787s** delivered to date contain a software defect that, in at least five identified aircraft, have erroneously reported their location to controllers, prompting two air traffic management agencies to put the Dreamliner on a **"blacklist**" for certain services.

Although it denies the software defect creates a safety hazard, Boeing says a service bulletin with instructions for operators to correct the position reporting error will be released "imminently".

The retrofits are expected to be installed across the fleet through 2016, but Boeing has no control over if or when an operator chooses to implement a voluntary service bulletin, the company says. New 787s delivered from Boeing's assembly lines are already equipped with software that corrects the original defect.

The issue came to light last December at an ICAO working group focused on automatic dependent surveillance-broadcast (ADS-B) transponders.

ICAO has since chronicled the problem in a series of reports from last February to late November,

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which are posted online but have so far been unreported.

The 787 software problem drove Canada's air traffic control organisation Nav Canada last year to "blacklist" all 71 787s that were then using the country's airspace. The blacklisting means the 787s are not allowed to use reduced separation procedures offered to other aircraft equipped with ADS-B.

Airservices Australia considered a similar limitation for the 787 fleet last year because of the same software problem, but the consequences would have been more severe. Unlike Canada, Australia mandates that all aircraft above 29,000ft must have ADS-B transponders.

A blacklisted aircraft would be treated the same as one that is not equipped with ADS-B, forcing 787 operators such as Jetstar to remain below 29,000ft while in Australian airspace.

Ultimately, Airservices Australia decided to accept the "risk" of allowing 787s to operate in ADS-B-mandated airspace with standard separation distances, ICAO's reports show. Airservices Australia also notified controllers about the existence of the software problem.

Finally, the agency blacklisted the 787 on surface management systems at three airports – Brisbane, Melbourne and Sydney. But the airport restriction was only intended to raise awareness about the issue, as other airport position monitoring systems can pinpoint the 787's location on the surface.

Nav Canada first detected a problem on 1 July 2014 when controllers noticed a 787 appearing to deviate up to 38nm (70km) from its planned track. The controllers alerted the crew by radio, but the pilots insisted their instruments showed they were still on course. Suddenly, however, the 787 "was observed jumping back to the flight plan route" on the controller's screens, according to ICAO documents.

Around four months later, Airservices Australia noticed a similar problem when a Jetstar 787 appeared to deviate "significantly" off-track, then suddenly "jump" back to the planned route on a controller's screen, the ICAO documents say.

Both agencies launched separate investigations before discovering they had witnessed the same problem while attending a December 2014 meeting of the ICAO ADS-B working group. They would later learn the same problem had been recorded in other airspace jurisdictions, including in Singapore.

At that point, Boeing was contacted to join the investigation. The company eventually traced the root cause back to the 787's packet-based data transfer system, which was passing the aircraft's position information from the integrated surveillance system to the ADS-B transponder, according to ICAO documents.

In rare cases, after passing a planned turn upon crossing a waypoint, the data packets that arrived at the transponder would contain either the aircraft's latitude or longitude, but not both. In those cases, the ADS-B transponder's software would extrapolate the 787's position based on the previous flight track before it made a planned turn at a waypoint. It would continue reporting the aircraft erroneously on the incorrect track until it received a data packet containing both the latitude and the longitude of the aircraft.

"It is important to understand that this is not a safety concern," Boeing says. "Existing systems such as radar provide the necessary positional data to [air traffic control] that allow the continued

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safe operation of the fleet.”

Airservices Australia reported to ICAO in November that it could still consider imposing a blacklist label on the 787, meaning the agency could restrict the aircraft to operate below 29,000ft. Airservices Australia said it would base its decision on how quickly 787 operators to implement Boeing’s service bulletin to retrofit the in-service fleet.

Boeing says the software update will "restore full ADS-B functionality". In the meantime, it says, the fleet "continues to operate safely with standard separations”.

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