

Fixing the Problem That May Have Caused the British Airways 777 Crash

Date: 03-17-2009 10:13 PM CET

Category: [Logistics & Transport](#)

Press release from: [AirSafe.com, LLC](#)

Agency: **Speedbrake Publishing**



March 17, 2009 - Recent findings from the AAIB accident investigation point to ice buildup in the fuel system as the key factor in the January 2008 crash of a British Airways 777 in London. On March 11th, 2009, the NTSB called for a redesign of the fuel system, and for the affected aircraft to have those changes installed within six months after the redesign is complete.

In the January 2008 crash, the flight from Beijing to London was routine until the the aircraft was on final approach, when both engines had an uncommanded power reduction, or engine rollback, which caused the plane to land short of the runway. Although the aircraft was seriously damaged, only one of the 136 passengers was seriously injured, and there were no serious injuries among the 16 crew members.

The two most likely accident scenarios that were investigated by the AAIB both involved ice formation within the fuel system, leading to a reduction of fuel flow. This ice formation was possible because the aircraft fuel did contain some water. This kind of contamination is normal, and in fact the fuel from the accident aircraft was tested, and found to be in compliance with the appropriate fuel specifications.

After an extensive analysis of the fuel system, the AAIB concluded that the most likely scenario for the engine rollback was that ice formed in the fuel pipes within the main fuel tank, and that during the latter part of the approach phase of the flight, factors such as turbulence, aircraft pitch changes, and increasing temperatures could have contributed to the sudden release of accumulated ice into the fuel feed system of both engines. This ice would have restricted the fuel flow through a component called the fuel oil heat exchanger and would have led to the engine rollbacks.

The AAIB recommended that Boeing and Rolls Royce review the aircraft and engine fuel system design, and make changes that would prevent ice from restricting fuel flow through the fuel oil heat exchanger.

In the US, the National Transportation Safety Board went further, recommending that within six months of completing the

redesign, that it be incorporated in all 777 aircraft using the Trent 800 engines.

The NTSB's recommendations were influenced by a second 777 rollback event. On November 26, 2008, a Delta 777, powered by two Trent 800 series engines, experienced a single-engine rollback while in cruise on a flight from Shanghai to Atlanta. The crew was able to address the issue and continued the flight without incident. Later analysis indicated that there was a blockage of the fuel oil heat exchanger on that engine that was likely due to ice accumulation.

Taken together, these developments are good news for the aviation community, especially passengers and crews flying on 777s equipped with Trent 800 engines. The investigative authorities have determined the likely cause of the event, the changes to the fuel system that are needed are well understood, and the engine and aircraft manufacturers are well on their way to developing solutions that will prevent similar occurrences in the future.

For more on this investigation, or for information about aviation safety or aviation security issues, please visit 777.AirSafe.org.

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