Transportation Safety Board of Canada | Bureau de la sécurité des transports du Canada

REASSESSMENT OF THE RESPONSES FROM THE EUROPEAN AVIATION SAFETY AGENCY TO AVIATION SAFETY RECOMMENDATION A06-06

RUDDER INSPECTION PROGRAM

Background

On 06 March 2005, at 0645 Coordinated Universal Time (UTC), Air Transat Flight 961 (TSC961), an Airbus A310-308 aircraft (serial number 597, registration C-GPAT), departed Varadero, Cuba, for Québec, Quebec, with 9 crew and 262 passengers on board. At approximately 0702 UTC, the aircraft was 90 nautical miles (nm) south of Miami, Florida, and in level flight at flight level (FL) 350 when the flight crew heard a loud bang and felt some vibrations. The aircraft entered a dutch roll and the captain disconnected the autopilot in order to manually fly the aircraft. The aircraft climbed nearly 1000 feet while the captain tried to control the dutch roll. The crew initiated a descent back to FL 350 and then requested further descent and a possible diversion to Fort Lauderdale, Florida. During the descent, the dutch roll intensity lessened and stopped when the aircraft descended through FL 280. No emergency was declared. The crew decided to return to Varadero when the aircraft was abeam Miami. The aircraft was cleared to Varadero at FL 190. During the landing flare, the captain, who was the pilot flying, noticed that he had no rudder authority while attempting to correct for a slight crab. The aircraft was landed and taxied to the gate where the passengers were deplaned through the main door. After shut-down, it was noted that the aircraft rudder had broken and was missing. One flight attendant suffered a minor injury.

On 27 March 2006, the Board released interim safety recommendations as part of its investigation (A05F0047) into this occurrence.

Board Recommendation A06-06 (27 March 2006)

The separation of the rudder from Air Transat Flight 961 and the damage found during the post-occurrence fleet inspections suggest that the current inspection program for Airbus composite rudders might not ensure the timely detection of defects. Moreover, preliminary tests demonstrating that disbonds could grow undetected due to altitude-related pressure differential suggest that increased attention is warranted to mitigate the risk of additional rudder structural failures. The consequences of a rudder separation include reduced directional control and possible separation of the vertical tail plane.

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Therefore, the Board recommended that:

> The European Aviation Safety Agency, in coordination with other involved regulatory authorities and industry, urgently develop and implement an inspection program that will allow early and consistent detection of damage to the rudder assembly of aircraft equipped with part number A55471500 series rudders.
>
> A06-06

Responses to Recommendation A06-06 (22 November 2006 and 17 January 2007)

In its 22 November 2006 response, the European Aviation Safety Agency (EASA) stated that it agreed with Board Recommendation A06-06 and that Airworthiness Directive 2006-0066 issued on 24 March 2006 requiring a mandatory one-time inspection satisfactorily addressed the Board recommendation.

Furthermore, in its response dated 17 January 2007, following a TSB conference call with the EASA on 20 December 2006, the EASA modified its response stating that all elements that may have potentially caused the damage growth were still being investigated. Furthermore, the EASA stated that, within the Continued Airworthiness process and in cooperation with Airbus, it continues its efforts to determine the most appropriate corrective actions. Subsequently, the EASA will consider mandating those actions, including amending the maintenance program to require repetitive inspections.

Board Assessment of the Responses to A06-06 (14 February 2007)

Although the EASA agreed with the Board recommendation, Airworthiness Directive 2006-0066 referenced in its 22 November 2006 response does not provide for a repetitive inspection cycle that will allow early and consistent detection of damage, as is implied in the core of Recommendation A06-06. Nevertheless, the TSB assessed that the EASA is well positioned to take a leadership role within the industry in advocating for the development and integration of an inspection program dealing with composite materials. On that basis, the 20 December 2006 conference call was initiated.

The 17 January 2007 response reflects EASA's commitment to continue to develop corrective actions that may include amending the maintenance program to require repetitive checks.

Because EASA's most recent response contains a proposed action that, if implemented, will reduce or eliminate the risks associated with this deficiency, the response to Recommendation A06-06 is assessed as **Satisfactory Intent**.

Next TSB Action (14 February 2007)

The Board will monitor subsequent responses from the EASA and the other addressees of Recommendation A06-06 to determine to what extent, if any, those responses will have a positive effect in mitigating the validated risks established in the preamble to the recommendation, both in the short and the long term.

This deficiency file is assigned an **Active** status.

Responses to Recommendation A06-06 (October 2007 and 17 January 2008)

The EASA, on 08 October 2007, issued AD 2007-0266 (Stabilizers - Vertical Stabilizer & Rudder Structure - Inspection/Repair forA310, A300-600 Aircraft), and on 14 January 2008, issued AD 2008-0012 (Stabilizers - Carbon Fiber Reinforced Plastic (CFRP) Rudder - Inspection/Repair for A330, A340-200/-300 Aircraft).

These ADs institute new, comprehensive inspection programs applicable to all the rudders of similar design on Airbus A300, A310, A330, and A340 aircraft. These ADs also demand more sophisticated techniques than the original tap test; specifically, the ADs require ultrasonic, thermography, and x-ray inspection processes. In addition, these ADs demand a mixture of new, one-time and repetitive inspections of areas where damages were found during the TSB investigation. The periodicity of these inspections is based on current knowledge of damage growth rates made evident by the TSB investigation.

Board Reassessment of the Responses to A06-06 (13 August 2008)

The recent EASA ADs now require comprehensive inspection programs utilizing more sophisticated techniques for all the rudders of similar design on Airbus A300, A310, A330, and A340 aircraft. In addition, these ADs demand a mixture of new, one-time and repetitive inspections that should be capable of timely detecting composite structure damage, similar to that discovered during this TSB investigation.

The EASA's most recent actions taken will significantly reduce the risks associated with the deficiency on which Recommendation A06-06 was based.

Therefore, this response is assessed as **Fully Satisfactory**.

Next TSB Action (13 August 2008)

No further action is required.

This deficiency file is assigned an **Inactive** status.