



REASSESSMENT OF THE RESPONSES FROM TRANSPORT CANADA AND THE FEDERAL AVIATION ADMINISTRATION TO AVIATION SAFETY RECOMMENDATION A02-05

POTENTIAL FOR CONTAMINATED THERMAL ACOUSTIC INSULATION BLANKETS AND DEBRIS TO PROPAGATE A FIRE

Background

The Boeing 767-300 aircraft (C-GHML, serial number 24948), operating as Air Canada Flight 116 with 8 crew members and 177 passengers on board, was on a scheduled flight from Vancouver, British Columbia, to Toronto/Lester B. Pearson International Airport, Ontario. At 2132 Coordinated Universal Time, while on final approach, approximately 10 miles from the airport, the flight crew received an aft cargo bay fire warning. The flight crew followed emergency checklist procedures, activated the cargo bay fire extinguishers, and declared an emergency. The fire warning light extinguished approximately 50 seconds after activation of the fire extinguishers. Flight 116 landed on Runway 06L and stopped to allow airport firefighters to inspect the aircraft for indications of fire.

Firefighters, using infrared sensing equipment, did not detect any sign of fire, but an odour of smoke was noted by both the cabin crew and flight crew. The flight crew taxied the aircraft to the terminal but stopped approximately 40 feet back from the gate to allow firefighters to open the aft cargo compartment for a detailed inspection. When firefighters entered the cargo compartment, they encountered a significant amount of smoke but did not detect any other signs of fire. During this time, the flight crew had prepared the aircraft for emergency evacuation. However, the situation was secured and passengers were deplaned using portable stairs. The aircraft was taken to a hangar for further inspection; company maintenance personnel discovered substantial soot and fire damage on the floor of the cargo bay.

On 14 November 2002, the Board released interim safety recommendations as part of its investigation (A02O0123) into this occurrence.

Board Recommendation A02-05 (14 November 2002)

The widespread existence of contaminated thermal acoustic insulation materials and debris on transport category aircraft exposes the travelling public to the risk of a self-propagating fire. Recent actions taken to reduce these risks are not comprehensive and do not adequately address risk in the long term. Consequently, there remain inadequate defences against contaminated insulation materials and debris propagating a fire; therefore, the Board recommended that:



The Department of Transport take action to reduce the short term risk and eliminate the long term risk of contaminated insulation materials and debris propagating fires, and coordinate and encourage a similar response from other appropriate regulatory authorities.

A02-05

Responses to A02-05 (Transport Canada - 05 February 2003 and Federal Aviation Administration - 04 April 2003)

On 05 February 2003, Transport Canada (TC) provided the following comments:

- TC recognized the potential for contamination to negatively affect the flame propagation characteristics of thermal/acoustic insulation materials.
- On 08 November 2001, TC published Maintenance Staff Instruction (MSI-42), "Procedures for the Inspection of Thermal/Acoustic Insulation During Heavy Maintenance Checks for Contamination." This MSI requires that primary maintenance inspectors ensure that operators of large transport category aeroplanes have established procedures in their approved maintenance schedule for the inspection of thermal/acoustical insulation during heavy maintenance checks.
- TC has raised the issue at the International Aircraft Materials Fire Test Working Group. A task group has been formed and work has already been initiated to review the subject and develop potential means for mitigation.
- TC has recognized the requirement to identify/develop "Harmonized International Standards" applicable to materials and material flammability that will address the aspects associated with material composition and the effects of contamination that will minimize the potential risks.
- TC is working with the Aging Transport Systems Rulemaking Advisory Committee (ATSRAC) on the enhanced zonal analysis procedure (EZAP) to implement an inspection program in wiring areas to remove debris.
- The Risk Management Process described in the general response will identify and quantify specific risk issues. This process will then lead to action plans and completion targets to be developed and implemented to reduce or mitigate these risks.

On 04 April 2003, the Federal Aviation Administration (FAA) provided the following comments:

- In its 19 March 2003 letter, the FAA's Seattle Office of Aircraft Certification indicates that it agrees with the recommendation.
- Currently, in the Boeing 767 Maintenance Review Board (MRB) report and the Maintenance Planning Data (MPD) documents there are no dedicated or scheduled maintenance tasks aimed at monitoring the condition of wiring, insulation blankets and debris.

- There are tasks in the Zonal Inspection Program and the Structures and Corrosion Prevention and Control Programs that identify zones containing wiring, insulation blankets and debris.
- The EZAP process resulted from recommendations made by the ASTRAC to modify aeroplane maintenance and training programs for large transport type aircraft. Under this process, manufacturers will identify all electrical wiring in each aeroplane zone; the zone is then assessed for containing any combustible material in that zone (including fluids, fuel vapours, dust/lint accumulation and contaminated insulation blankets). Electrical wiring is also evaluated for possible deterioration that may be liable to create an ignition source. Under EZAP, aircraft wiring will be given more emphasis than in the zonal inspection program especially when it is near any combustible materials. EZAP will be required to be implemented by aeroplane manufacturers under Maintenance Steering Group 3, revision 2001.
- Boeing is proposing to form an EZAP working group consisting of manufacturers, operators and regulatory personnel during the third quarter of 2003 with an estimated completion time of November 2003. EZAP maintenance tasks will then be implemented into the MRB report and the MPD.

Board Assessment of the Responses to A02-05 (30 September 2003)

In the short term, actions taken as a result of MSI-42 should lead to Canadian operators discovering contaminated insulation materials and debris during heavy maintenance checks, and taking follow-up corrective action.

In the long term, EZAP should result in zonal inspections being scheduled based on an assessment of the potential for fire in a particular zone.

TC's written response to the recommendation, as well as information obtained by attending its risk assessment process, indicates that TC intends to determine an appropriate means of addressing the issue of contaminated insulation materials and debris propagating fires. Specific action to substantially reduce or eliminate the deficiency, however, has not yet been actually implemented. Consequently, TC's response is assessed as being **Satisfactory Intent**.

Next TSB Action (30 September 2003)

TC has indicated that it will provide an updated response to the TSB. The Air Branch will continue to monitor TC's future actions related to this recommendation. The assessment will be updated when more information is received from TC.

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

Responses to A02-05 (Transport Canada - 14 December 2005 and Federal Aviation Administration - December 2005)

TC's letter of 14 December 2005 indicates the following:

- To address the short-term risk, TC published Airworthiness Notice B066 on 25 March 2003 to advise the aviation community on the hazards associated with the use of metallized polyethylene terephthalate (MPET) insulation in aircraft applications.
- To address the long-term risk, TC published on 30 June 2004 MSI-42 titled "Maintenance Schedule Amendment Instructions for the Inspection of Thermal/Acoustic Insulation." This instruction was intended to ensure that specific attention is directed to the inspection of thermal/acoustic insulation materials where increased levels of susceptibility to contamination are inadequately addressed within the air operator's maintenance schedule.

TC also has drafted a publication titled *Enhanced Zonal Analysis Procedures (EZAP)* (TP 14331), which includes recommendations to industry for more robust maintenance practices specifically directed towards enhancing the maintenance programs for aircraft whose current program does not include tasks derived from a process that specifically considers wiring in all zones as the potential source of ignition of a fire. This document promotes a housekeeping philosophy of "protect, clean as you go" when performing maintenance, repair or alterations on or around aircraft electrical wiring interconnection systems. The enhanced zonal inspections are to detect any unsatisfactory conditions and discrepancies, which include the accumulation of any dust, dirt, and contamination by liquids, etc. whose presence could contribute to the sustained combustion of a material after the removal of the ignition source. TP 14331 was scheduled for publication in December 2005.

In December 2005, the FAA advised that its Notice of Proposed Rulemaking titled "Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety" issued 06 October 2005 proposes a requirement that EZAP be included in aircraft maintenance programs. The industry would have until 16 December 2008 to implement this rule. Additionally, the FAA, as part of its International Aircraft Materials Fire Test Working Group, continues to gather contamination data to provide improved insulation blanket maintenance instructions.

Board Reassessment of the Responses to A02-05 (23 June 2006)

TC's letter of 14 December 2005 indicates action to address the deficiency raised in Recommendation A02-05. MSI-42 entitled "Maintenance Schedule Amendment Instructions for the Inspection of Thermal/Acoustic Insulation," issued 30 June 2004, was intended to ensure that attention is directed to the inspection of thermal/acoustic insulation materials where increased levels of susceptibility to contamination are inadequately addressed within the air operator's maintenance schedule. On 30 September 2005, TC issued Transport Publication TP 14331 entitled *Enhanced Zonal Analysis Procedures*, which includes recommendations for more robust aircraft maintenance practices that promote a housekeeping philosophy to "protect, clean as you go." TC's implementation of the guidance material contained in MSI-42 and TP 14331 will substantially reduce the safety deficiency as described in Recommendation A02-05.

Therefore, the assessment is now assigned **Fully Satisfactory**.

Next TSB Action (23 June 2006)

As the safety deficiency associated with Recommendation A02-05 is considered rectified, no further action is necessary.

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