



REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A03-02

Thermal acoustic insulation materials: Proposed certification standard for thermal acoustic insulation materials

Background

On 02 September 1998, Swissair Flight 111, a McDonnell Douglas MD-11 aircraft, departed John F. Kennedy Airport in New York, New York, en route to Geneva, Switzerland. Approximately one hour after take-off, the crew diverted the flight to Halifax, Nova Scotia, because of smoke in the cockpit. While the aircraft was manoeuvring in preparation for landing in Halifax, it struck the water near Peggy's Cove, Nova Scotia, fatally injuring all 229 occupants on board. The investigation revealed that the flight crew had lost control of the aircraft as a result of a fire in the aircraft's ceiling area, forward and aft of the cockpit bulkhead.

The Board concluded its investigation and released report A98H0003 on 27 March 2003.

TSB Recommendation A03-02 (March 2003)

By developing the Radiant Panel Test (RPT), the Federal Aviation Administration (FAA) has successfully designed a single certification test that, while a major improvement over the vertical Bunsen burner test, may not successfully evaluate the performance of all types of thermal acoustic insulation materials under representative conditions. Given these limitations of the FAA's proposed RPT, the Board recommended that:

Regulatory authorities develop a test regime that will effectively prevent the certification of any thermal acoustic insulation materials that, based on realistic ignition scenarios, would sustain or propagate a fire.

TSB Recommendation A03-02

Transport Canada's response to Recommendation A03-02 (June 2003)

In its 16 June 2003 response to Recommendation A03-02, Transport Canada (TC) provided the following comments:

TC agrees with the objective of this recommendation.

- TC considers that the TSB's concerns have or are being addressed.
- TC states that the FAA is developing advisory material to address these issues that will be used concurrently with the final rule implementing the RPT.

- TC has contacted the FAA to raise this "issue" with the FAA's International Aircraft Materials Fire Test Working Group.

TSB assessment of Transport Canada's response to Recommendation A03-02 (October 2003)

In brief, the deficiencies raised by TSB's Recommendation A03-02 deal with the following limitations of the FAA's proposed RPT: specimen orientation, preheat, testing materials as a system, and the role of in-service contamination.

As stated in the TC response, the FAA has declared its intention to develop advisory material in support of its final RPT rule. However, the FAA did not issue this advisory material in concert with the final RPT rule, but rather indicated that advisory material would be forthcoming to deal with specifics such as test sample configurations, insulation on air ducts, and the installation techniques for insulation materials. The final rule does not indicate whether the advisory material will deal with either the preheat or contamination issues. The advisory material has yet to be published. The planned action when fully implemented will substantially reduce or eliminate the safety deficiency.

Therefore, the response is assessed as **Satisfactory Intent**.

Transport Canada's response to Recommendation A03-02 (December 2005)

In its update of active recommendations dated 14 December 2005, TC indicated that an update to Recommendation A03-02 was not available due to scheduling conflicts for some Swissair Recommendation team members. Furthermore, TC indicated that an update will follow as soon as team members can meet and draft updates.

TSB reassessment of Transport Canada's response to Recommendation A03-02 (July 2006)

TC's letter to the TSB dated 14 December 2005 did not include an update with respect to Recommendation A03-02. As of this date, TC has yet to update the TSB as to whether or not it has taken action with respect to harmonizing the Canadian Aviation Regulations (CARs) with the applicable amendments to the Federal Aviation Regulations (FAR 25.856 + Parts VI & VII of APP F of FAR 25) and the FAA Advisory Circular 25.856-1 as stated in its June 2003 response to the TSB.

It is the Board's understanding that TC remains committed to providing an update to its original action plan, which, if fully implemented, will substantially reduce or eliminate the deficiencies as described in the Recommendation A03-02.

Therefore, the assessment remains at **Satisfactory Intent**.

Transport Canada's response to Recommendation A03-02 (February 2007)

TC's response reviews previously known regulatory action taken to develop and implement improved flammability standards for thermal acoustic insulation materials used in transport category airplanes. TC advises that it has adopted the FAA's revised flammability-related design standards for thermal acoustic insulation materials as Airworthiness Manual Chapter 525, Section

525.856 of its CARs. TC also states that its activity to address the deficiency identified in Recommendation A03-02 is complete.

TSB reassessment of Transport Canada's response to Recommendation A03-02 (July 2007)

TC's response states that it has harmonized its CARs with the FAA's revised regulations dealing with improved flammability standards for thermal acoustic insulation materials. However, as projected in a previous response to the TSB dated June 2003, TC has yet to state its position relating to FAA's Advisory Circular 25.856-1, which was published to address some, if not all, of the risks associated with the deficiency identified in Recommendation A03-02. Furthermore, TC states that its actions with respect to the deficiency identified in Recommendation A03-02 are complete.

TC's action will not substantially reduce the deficiency; therefore, the assessment is **Satisfactory in Part**.

Transport Canada's response to Recommendation A03-02 (March 2008)

TC's response repeats previously known regulatory action to adopt revised design standards for thermal acoustic materials. Additionally, TC indicates that Notice of Proposed Amendments (NPAs) 2005-044 and 2005-068 are in progress to develop operational rules to address newly manufactured aeroplanes and for replacement of existing insulation materials. These NPAs would be applicable to Transport Category aeroplanes operating under Section 705 of the CARs.

Consequently, TC considers this recommendation closed because:

- TC has completed the task and has communicated to the Board in response to the recommendation.
- Appropriate mitigation is in place for the unacceptable risks identified.
- Any further changes in this area will take place as a result of international regulation harmonization..

TSB reassessment of Transport Canada's response to Recommendation A03-02 (August 2008)

TC's response states that it has harmonized its CARs design standards with the FAA's revised regulations for thermal acoustic materials. Consequently, in accordance with paragraph 4 (a) of TC's Airworthiness Manual Advisory Index, dated 01 December 2004, the associated FAA Advisory Circular 25.856-1 is considered acceptable to TC. Additionally, TC states that its NPAs, to change Section 705 of the CARs operational rules dealing with newly manufactured aeroplanes and the replacement of insulation materials in existing aircraft, have yet to be finalized.

TC's action, when fully implemented, will substantially reduce or eliminate the deficiency.

Therefore, the response is assessed **Satisfactory Intent**.

Review of Recommendation A03-02 deficiency file status (September 2009)

In its latest position statement regarding the deficiency identified in Recommendation A03-02, TC states that based on the adoption of new design standards and regulatory changes in progress it considers this recommendation closed and plans no further action.

Therefore, the assessment remains at **Satisfactory in Part**.

The Board also concludes that, as no further action is planned by TC to address any residual risk, continued reassessment will not likely yield further results.

Review of Recommendation A03-02 deficiency file status (May 2019)

The Board requested that all recommendations 10 years old or more be reviewed to determine if the deficiency file status was appropriate. After an initial evaluation, it was determined that the safety deficiency addressed by Recommendation A03-02 needed to be reassessed.

A request for further information was sent to Transport Canada (TC) and a reassessment will be conducted upon receipt of TC's response. In the interim, the assessment remains at **Satisfactory in Part**.

Consequently, the status of Recommendation A03-02 is changed to **Active**.

Transport Canada's response to Recommendation A03-02 (May 2019)

TC agrees in principle with the recommendation.

In 2009, TC communicated that based on the adoption of new designs standards and regulatory changes in progress, TC considered the safety issue raised by the TSB addressed.

TC has no new information to provide at this time.

TSB reassessment of Transport Canada's response to Recommendation A03-02 (March 2020)

In its response, Transport Canada (TC) indicated that it agrees in principle with Recommendation A03-02.

To date, a number of actions have been taken by TC that address the safety deficiency identified in Recommendation A03-02, regarding the development of a test regime that will effectively prevent the certification of any thermal acoustic insulation materials that, based on realistic ignition scenarios, would sustain or propagate a fire. These include the following:

- In 2003, TC issued Airworthiness Notice B066 – *Insulation blanket covers and Tapes Metallized Polyethylene Terephthylene (MPET)*, informing Canadian aircraft owners and operators about the fire hazards associated with MPET-covered thermal acoustic insulation material, and recommending measures to eliminate the use of such material in all aircraft types.
- In 2005, the FAA published Advisory Circular (AC) 25.856-I Thermal/Acoustic Insulation Flame Propagation Test Method Details.
- In 2008, the FAA published AC 25.856-2A Installation of Thermal/Acoustic Insulation for Burn through Protection.

Additionally, new flammability standards were issued by the FAA (14 CFR Part 25.856) in 2003, by TC (*Canadian Aviation Regulations* (CARs) Standard 525.856) in 2004, and by the European Union Aviation Safety Agency (EASA) (CS 25.856) in 2009. These standards require insulation materials to undergo a more stringent flammability test, which includes new flammability requirements that address flame propagation. As a result, aircraft manufactured and/or registered in Canada, the U.S. and Europe are no longer manufactured or repaired with MPET or AN-26 thermal acoustic insulation materials.

Many actions have been taken over the years that have addressed the safety deficiency identified in Recommendation A03-02. The Board believes that through the elimination of MPET and AN-26 thermal acoustic insulation materials, as well as new flammability standards and testing, the risk associated with Recommendation A03-02 has been substantially reduced.

Therefore, the Board considers the response to the recommendation to be **Fully Satisfactory**.

Next TSB action

This deficiency file is **Closed**.