



REASSESSMENT OF THE RESPONSES FROM TRANSPORT CANADA TO AVIATION SAFETY RECOMMENDATION A99-04

FLIGHT RECORDER DURATION AND POWER SUPPLY: DURATION OF COCKPIT VOICE RECORDER INFORMATION

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 fire also resulted in an interruption to the aircraft's power supplying the Swissair Flight 111 flight recorders; this occurred about six minutes before the aircraft struck the water.

On 09 March 1999, the Board released interim safety recommendations as part of its investigation (A98H0003) into this occurrence.

Board Recommendation A99-04 (09 March 1999)

Regulatory requirements in Canada, the United States and Europe stipulate that recorders be installed so that they receive power from the electrical bus that provides the maximum reliability for operation without jeopardizing service to essential or emergency loads. With both the cockpit voice recorder (CVR) and the flight data recorder (FDR) on the same generator bus, however, a failure of that bus or the intentional disabling of the bus (as could result from checklist actions in an emergency) result in both recorders losing power simultaneously. To enhance the capture of information needed for the identification of safety deficiencies, the Board recommended that:

Aircraft required to have two flight recorders be required to have those recorders powered from separate generator buses.

A99-04



Response to A99-04 (07 June 1999)

In its response of 07 June 1999, Transport Canada (TC) noted that CAR 551.01, CAR 605.33 and Airworthiness Manual 551.100 require the use of separate supply buses. Furthermore, the TC requirement is harmonized with the European Organisation for Civil Aviation Equipment (EUROCAE) ED-56A by reference.

Board Assessment of the Response to A99-04 (17 March 2000)

TC's written response appears to indicate that it does support the TSB recommendation because it believes that a requirement already exists for flight recorders to be on separate electrical buses. TSB staff did not agree with this interpretation and met with TC staff on 06 March 2000 to discuss the issue. At the meeting, TC indicated that it does, in fact, interpret the applicable provisions in a manner supportive of the TSB's concerns. It also indicated that it now agrees that the applicable wording in the EUROCAE document should be improved to address the Board's concerns, and that it would issue a letter of clarification to the TSB to document its intention to work with the TSB to change the EUROCAE standard accordingly. Given TC's current interpretations of the provisions, and its stated intention to help improve the provisions, the response is assessed as **Satisfactory Intent**.

Next TSB Action (17 March 2000)

TSB staff will monitor TC's activity with respect to the risks associated with Recommendation A99-04.

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

Response to A99-04 (14 December 2005)

TC's update to the TSB, received 14 December 2005, indicates that power requirements for the FDR and CVR remain unchanged since the date that Recommendation A99-04 was issued.

Board Reassessment of the Response to A99-04 (12 July 2006)

In its response dated 14 December 2005, TC states that power requirements for both CVR and FDR remain unchanged since the date Recommendation A99-04 was issued. Although TC is monitoring the Federal Aviation Administration (FAA) rulemaking effort (FAA-2005-20245 refers), its response does not indicate whether it intends to harmonize with the final FAA rule changes. As of June 2006, the FAA has yet to release its final rule that would require newly manufactured aircraft to be designed so that no single electrical failure will disable both the CVR and FDR.

It is the Board's understanding that TC remains committed to its previously stated action plan that will, if fully implemented, substantially reduce or eliminate the safety deficiency as described in Recommendation A99-04.

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

Next TSB Action (12 July 2006)

TSB staff will liaise with TC to confirm its intention to harmonize with the FAA's final rule with respect to the deficiency raised in Recommendation A99-04.

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

Response to A99-04 (07 February 2007)

TC's letter to the TSB dated 07 February 2007 restates its 14 December 2005 position.

Board Reassessment of the Response to A99-04 (24 July 2007)

TC's response dated 07 February 2007 is a repeat of its position as stated 14 December 2005. TC again states that the *Canadian Aviation Regulations* (CARs) require the use of separate power supply buses and that the TC requirement is harmonized with EUROCAE documents ED-55 and ED-56A (both references were superseded by ED-112 in 2003). It would appear that TC has reverted to its original rejection of the deficiency as it applies to TC.

TC also states that it continues to monitor the FAA rulemaking but refers to the issue of independent power supply versus separate generator buses as stated in Recommendation A99-04.

Regardless, because the FAA's proposed regulatory change with respect to the use of separate generator buses, if fully adopted by TC, will substantially reduce or eliminate the safety deficiency as described in Recommendation A99-02, the assessment remains at **Satisfactory Intent**.

Next TSB Action (24 July 2007)

TSB staff will seek clarification in writing from TC with respect to the use of outdated EUROCAE references in the CARs, its reference to independent power supplies versus separate buses and its overall position with respect to the deficiency as described in Recommendation A99-04.

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

Response to A99-04 (11 March 2008)

In its response of 11 March 2008, TC repeats its previously stated position that EUROCAE documents, referenced in the CARs, require that recorders be powered from separate generator buses. Additionally, TC states that Canadian Airworthiness Manual 551, subchapters 100 and 101, and guidance material (FAA Advisory Circular 20-141) provide adequate consideration and guidance for selecting the appropriate power source for the installation of aircraft flight recorders.

TC is adamant that there is no deficiency in the Canadian system because it requires aircraft with two flight recorders to have those flight recorders powered from separate generator buses.

Board Reassessment of the Response to A99-04 (13 August 2008)

TC is likely to harmonize the CARs with the recently released FAA final rule, which requires that any single electrical failure external to the recorder does not disable both the CVR and the FDR by 07 April 2012. If so, such a rule will substantially reduce or eliminate the safety deficiency as described in Recommendation A99-04.

Moreover, because TC's response declares that it does not allow an aircraft to have its CVR and FDR powered from the same generator bus, regardless of how the Airworthiness Manual and guidance material are interpreted, the deficiency raised in Recommendation A99-04 cannot exist in a Canadian-registered aircraft.

Therefore, the assessment is changed to **Fully Satisfactory**.

Next TSB Action (13 August 2008)

No further action is required.

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