



## **REASSESSMENT OF THE RESPONSES TO AVIATION SAFETY RECOMMENDATION A90-94**

### **Availability of flight data recorder correlation data**

#### **Background**

On 26 September 1989, a Fairchild Metro III was on a scheduled flight from Vancouver to Terrace, British Columbia with two pilots and five passengers on board. The aircraft crashed one-quarter mile to the west of the Terrace Airport while the crew was attempting to carry out a missed approach in IFR conditions. The aircraft was destroyed by the impact and a post-crash fire. All seven persons on board were fatally injured in the crash.

The Transportation Safety Board of Canada (TSB) determined that the crew continued with the approach beyond the missed approach point without establishing the required visual references. The evidence indicates that, while subsequently carrying out a missed approach in IFR conditions, the aircraft was flown into the ground in a manner consistent with disorientation. Contributing to the occurrence were the inadequacy of the company's operating procedures, reduced operating standards, and the inadequate definition of the visual references required for a circling approach.

As a result of the investigation into this occurrence, eight recommendations were issued to TC on January 7, 1991.

The Board concluded its investigation and released report A89H0007 on 11 December 1990.

#### **Board Recommendation A90-93 (07 January 1991)**

##### **FDR approval process**

According to the Flight Data Recorder Order ANO Series II No.13 and a TC waiver policy on FDRs, the METRO III should have been equipped with a six-parameter digital FDR. In addition, ANO Series II No.13 and the Engineering and Inspection Manual (Part II Section 3.9) require the existence of FDR calibration and correlation documentation and a company maintenance plan for each FDR installation.

Ensuring that an appropriate FDR was installed should have been part of the TC approval process for the operation of this aircraft under the company's OC. This should have been done using TC Form 26-0046, which includes FDR availability as a check-off item for the TC Regional Air Carrier submission to TC Headquarters. Since this form does not include a specific provision for designating the type of FDR, the unauthorized FDR was not detected by the TC officials certifying the aircraft.

Ensuring that the FDR met the airworthiness installation and functional requirements should also have been part of the TC approval process for the aircraft's C of A. Normally, this should have been done when the initial type approval was done, based on the calibration data provided by the manufacturer. However, an imported aircraft's FDR is considered a follow-on installation; therefore, before a Canadian C of A for this aircraft was issued, the company should have been required to provide TC with the FDR calibration and correlation data, along with proof of the proper operation of the FDR and the existence of a company maintenance plan.

For the accident aircraft, a proper-type FDR was not installed, the calibration data was not provided to TC, the company did not have an FDR maintenance plan, and neither the company nor TC verified the proper operation of the installed FDR. FDR orders and standards exist to provide important information concerning flight characteristics for accident investigations and subsequent accident prevention. The absence of FDR heading information for this occurrence precluded an accurate determination of the flight path during the final minutes of flight; also, the lack of correlation data significantly complicated the precise determination of the remaining four parameters. Thus, the ability to identify safety deficiencies was hampered.

The anomalies noted in the approval process for this FDR installation may be an isolated case. Nevertheless, the TSB believes that the TC approval process for OCs and C of As is not adequate to ensure proper compliance with existing FDR ANO and Engineering and Inspection Manual requirements. That there are still a number of foil-type FDRs being used in Canada is of particular concern. Accident investigation experience indicates that, because of difficulties in maintaining and verifying the operation of foil FDRs, the reliability of these systems is at best uncertain.

Therefore, TSB recommends that:

The Department of Transport ensure that the appropriate FDR correlation data is available for all installed FDRs and that companies have adequate maintenance plans and procedures for ensuring the continued serviceability of these FDRs.

CTAISB Recommendation A90-94

## **Transport Canada's response to A90-94 (15 April 1991)**

### **Availability of flight data recorder correlation data A90-94**

Paragraphs 3.9.7 and 3.9.8 of Section 3.9, Chapter III, Part II of the Engineering and Inspection Manual delineate the required documentation for the approval and maintenance of FDR Systems. Paragraph 3.9.8 specifically requires that a maintenance plan be provided and that the plan be submitted to the Regional Manager for approval. Paragraph 3.9.8 also requires that "each operator shall be able to produce on demand current calibration and correlation data in respect of each aeroplane in service".

To ensure that these data are available for installed FDRs, the Department will:

- issue a policy letter requiring regional offices to review the status of FDR installations in their areas, and
- review the procedures for the issuance of operating certificates where non-compliance with FDR requirements is evident.

### **Board assessment of Transport Canada's response to A90-94 (no date on the document)**

ANO Series II, No.13 and the Engineering and Inspection (E&I) Manual Part II, Section 3.9 require the existence of FDR calibration and correlation data, and a company maintenance plan for each FDR installation. Ensuring that the installed FDR meets the airworthiness installation and functional requirements is part of TC's approval process for the aircraft's C of A.

For this occurrence, the aircraft was issued a C of A, even though the company did not have a maintenance plan for the FDR, and neither the company nor TC had correlation and validation data for the FDR. More important, however, is the fact that the heading track on the FDR of the occurrence aircraft was not functioning, which precluded an accurate determination of the aircraft's flight path; also, the lack of correlation/calibration data significantly complicated the precise determination of the four remaining parameters.

TC appears to have accepted the Recommendation and will issue a policy letter to its Regions, directing them to review the status of FDR installations in their areas and to review the procedures for the issuance of Operating Certificates where non-compliance with FDR requirements is evident.

Therefore, the response is assessed as **Satisfactory**. The staff will review the policy letter when it is issued.

### **Board reassessment of the response to A90-94 (26 November 1996)**

Unsatisfactory FDR/CVR installation found on Sandy Lake HS-748 (A94H0023 refers). New TSB Recs on FDRs/CVRs A94-02 - response has been assessed as **Satisfactory Intent**.

Therefore, the assessment is **Satisfactory Intent**.

### **Board reassessment of the response to A90-94 (19 November 1997)**

A TSB developed event recorder Statement of Requirements (SOR) is currently being debated within the CARAC process. TSB is working with TC R&D section to develop a Flight Recorder Conf. Standard for use by industry and TC. A90-93 & A94-02 raise similar issues.

Therefore, the assessment is **Satisfactory Intent**.

## **Board reassessment of the response to A90-94 (28 January 2004)**

Using current assessment criteria, proposed action would be assessed as **Satisfactory Intent** vice **Fully Satisfactory**. Indications are that TC's internal policies regarding FDR requirements may not have had the desired effect as evidenced by subsequent recommendation A94-02. Due to its similarity, suggest this recommendation be de-activated with any outstanding concerns to be dealt with as per A94-02.

Therefore, the assessment is **Satisfactory Intent**.

As such, **Further Action is Unwarranted** on this recommendation, and the status of A90-94 is now **Inactive**.

## **Board review of A90-94 deficiency file status (02 April 2014)**

The Board requested that A90-94 be reviewed to determine whether the deficiency file status was appropriate. After an initial evaluation, it was determined that the safety deficiency addressed by Recommendations A90-94 and A90-93 is addressed by the more recent Recommendation A94-02.

It is therefore appropriate to follow the progress on flight data recording (FDR) safety issues through Recommendation A94-02. A94-02 was rated **Fully Satisfactory** on 01 March 2005 and is now **Closed**.

Therefore, the assessment of A90-94 is changed to **Fully Satisfactory**.

## **Next TSB action**

The status of recommendation A90-94 is **Closed**.