



REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A94-04

Updated flight data recorder and cockpit voice recorder requirements

Background

On 10 November 1993, a Hawker Siddeley HS 748 aircraft operated by Air Manitoba departed Winnipeg, Manitoba, at 1438 Central Standard Time (CST) for Sandy Lake, Ontario. On arrival at Sandy Lake at approximately 1549 CST, the crew attempted to land but were unable to because of the low ceiling and visibility. They then diverted to St. Theresa Point, Manitoba, landing at 1630 CST. After a normal turnaround, the flight returned to Sandy Lake and landed at approximately 1745 CST. The aircraft took off from runway 29 at Sandy Lake at approximately 1805 CST and immediately entered a right turn. After turning through about 120 degrees, the aircraft descended into 100-foot trees and crashed. All 7 occupants of the aircraft were fatally injured, and the aircraft was destroyed.

The Board determined that, after take-off, the crew most likely lost situational awareness and, as a result, did not detect the increasing deviation from their intended flight path. Contributing to the loss of situational awareness was the lack of AC power to some of the flight instruments; the reason for the lack of AC power could not be determined.

Immediately following the occurrence, the flight recorders were recovered in a serviceable condition; however, no data was recorded with respect to the occurrence flight. In the past, the Board has made recommendations concerning deficiencies on the retrieval and quality of recorded data and on the lengthy process required to update flight recorder legislation. Notwithstanding the emphasis that the Board has put on the importance of flight recorders for investigation and accident prevention processes, there has not been any significant progress in addressing these flight recorder deficiencies.

The Board concluded its investigation and released report A93H0023 on 14 March 1995.

TSB Recommendation A94-04 (January 1994)

Flight recorder information is often invaluable in the investigation of occurrences and it most certainly would have assisted in determining the events leading to this accident. In the past, the Board has made recommendations concerning deficiencies on the retrieval and quality of recorded data and on the lengthy process required to update flight recorder legislation. Notwithstanding the emphasis that the Board has put on the importance of flight recorders for investigation and accident prevention processes, there has not been any significant progress in addressing these flight recorder deficiencies.

Therefore, the Board adopted the following recommendation:

The Department of Transport streamline its processes to facilitate the timely Canadian implementation of updated flight recorder requirements.

TSB Recommendation A94-04

Transport Canada's response to Recommendation A94-04 (April 1994)

Legislation (Recommendation A94-04)

The Regulatory Renewal Project is incorporating existing regulations in a new regulatory structure consisting of regulations with standards incorporated by reference. The intent is that the standards will be contained in an incorporated document that is much more easily amended than the regulation.

Concerning the revised recorder regulations, we have a consensus with industry that agrees to full harmonization with the *Federal Aviation Regulations* (FAR) of the U.S.A. Hence, the draft regulations have been finalized. The regulation section will stipulate briefly which aircraft require FDRs and CVRs. The standards section will list parameters, operational requirements and other technical specifications.

TSB assessment of the response to Recommendation A94-04 (no date on document)

In response to these recommendations, Transport Canada (TC) has undertaken a program to review operator compliance with existing recorder requirements in order to identify areas of the monitoring and approval processes that need revision. In addition, TC stated its intention in April 1994 to issue two interim circulars to facilitate industry adjustment to the new recorder regulation expected to come into law in early 1995. With respect to streamlining the recorder legislation process, TC stated that a new regulatory structure will have regulations which incorporate standards by reference in order to facilitate amendment in a timely way. TC's new approach to use standards to keep pace with changing requirements in aviation, and in particular flight recorder technology, is an important improvement in the regulatory process. Also, TC has reached consensus with industry to harmonize with the U.S. *Federal Aviation Regulations* (FAR) in finalizing the draft Canadian regulations.

The new regulation will state which aircraft will require FDRs and CVRs; the standards section will list parameters, operational requirements, and other technical specifications. The Department of Justice has advised that it is prepared to carry out its regulatory functions as quickly as possible to ensure the regulations proposed by TC can be promulgated with the least possible delay.

Revised legislation process (Recommendation A94-04)

TC indicates that the new regulatory structure will have regulations which will incorporate standards by reference, thus facilitating amendments in a timely way. Also, TC has reached consensus with industry to harmonize with the U.S. *Federal Aviation Regulations* (FAR).

The approach by TC to use standards to keep pace with changing requirements in aviation, and in particular flight recorder technology, is an important improvement in the regulatory process.

Therefore this response is considered as having **Satisfactory Intent**.

TSB reassessment of the response to Recommendation A94-04 (April 1999)

Current CVR/FDR standards (CARs 625.33 refers) were adopted despite observations by TSB (DGIO letter dated 27 September 95) that warned they were outdated. TSB continues to participate within CARAC to develop more relevant *Canadian Aviation Regulations* (CARs). Recommendation A90-55 raises similar issues.

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

TSB reassessment of the response to Recommendation A94-04 (February 2004)

Amending those recorder requirements by “Standards” seems more efficient; however, those aspects which require regulatory change may still involve a lengthy process. The Board suggests “Further Action Unwarranted” at this time (however, this recommendation should be tracked in conjunction with Swissair recommendations A99-01 and A99-02).

Therefore, the response is reassessed as **Satisfactory in Part**.

As such, **Further Action is Unwarranted** on this recommendation, the safety issue is addressed by Recommendation A99-02 and the status is now **Inactive**.

TSB review of Recommendation A94-04 deficiency file status (April 2014)

The Board requested that Recommendation A94-04 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 A94-04 is addressed by the more recent Recommendation A99-02.

It is therefore appropriate to follow the progress on flight recorder safety issues through Recommendation A99-02.

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

Transport Canada’s response to Recommendation A94-04 (March 2015)

Transport Canada agrees with the intent of the recommendation. It is anticipated that proposed regulations that address this recommendation will be pre-published in the *Canada Gazette* Part I in spring 2016.

TC indicated that delays are sometimes inevitable when higher priority tasks take up resources in the regulatory program. The defined criteria for assigning priority to regulatory initiatives are presented in the following table.

Transport Canada list of regulatory priorities

Priority 1	Speech from the throne, Budget, Other High Level Government Commitment, initiatives related to the Red Tape reduction and Canada-U.S. Regulatory Cooperation Council
Priority 2	Ministerial priority, Urgency, Transportation Safety Board Watchlist Initiatives
Priority 3	High Strategic Outcome Priority, International/Federal-Provincial Obligations, Time Pressure, other TSB initiatives
Priority 4	Efficiency, Parliamentary, Stakeholder Priorities

Priority 5	Miscellaneous Amendments
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Note that the TSB Watchlist initiatives and other TSB initiatives are assigned Priority 2 and 3 respectively. These high ratings were assigned because the department takes TSB safety action very seriously. Occasionally, however, even important regulatory initiatives are shifted due to higher priority issues. The Board should be aware, however, that once Civil Aviation commits to regulatory action, timing may change, but the department will proceed with the initiative until it is completed.

TSB reassessment of the response to Recommendation A94-04 (March 2015)

In the Board's last re-assessment, the response to this recommendation was linked to Transport Canada's response to Recommendation A99-02. Transport Canada's response restates its support for the intent of Recommendation A99-02. Additionally, it advises that the proposed regulations contained in NPA 2011-010 are further delayed and will not be pre-published in the *Canada Gazette*, Part I until the first quarter of 2016. This further delay will undoubtedly push the implementation date of the proposed regulatory change well beyond the current target of 1 January 2016. In the meantime, the CARs will continue to lack harmonization with both the FAR requirement and the ICAO standard for 2-hour CVR.

Despite implementation delays, Transport Canada is proposing regulatory changes that, when fully implemented, will substantially reduce or eliminate the safety deficiency identified in Recommendation A99-02 which in turn will do the same for Recommendation A94-04. While Transport Canada's proposed measures are reasonable, the protracted delays are not.

Therefore, the assessment rating for this recommendation is changed to **Unsatisfactory**.

Transport Canada's response to Recommendation A94-04 (November 2015)

(Includes recommendations A91-13, A99-02, and A99-03.)

Transport Canada agrees with the intent of the recommendation.

It is anticipated that the proposed regulations that address this recommendation will be pre-published in the *Canada Gazette*, Part I in 2016.

TSB reassessment of the response to Recommendation A94-04 (March 2016)

The Board has linked the mitigation of the risks associated with Recommendation A94-04 to its assessment of Recommendation A99-02. Transport Canada's latest update repeats the statement that its proposed regulations to address the risks identified in Recommendation A99-02 are to be pre-published in the *Canada Gazette*, Part I in 2016.

While Transport Canada's proposed regulatory changes are reasonable, the protracted delays are not.

Therefore, the assessment rating for this recommendation remains **Unsatisfactory**.

Transport Canada's response to Recommendation A94-04 (January 2017)

It is anticipated that the proposed regulations that address the CVR (2-hr recording capacity) component of this recommendation will be pre-published in the *Canada Gazette*, Part I, in summer 2017.

TSB reassessment of Transport Canada's response to Recommendation A94-04 (March 2017)

TC's latest update indicates that its proposed regulatory amendments, designed to mitigate the risks associated with the CVR component of Recommendation A94-04, is anticipated to be pre-published in the *Canada Gazette*, Part I, in summer 2017. Since 2011, this milestone has been revised three times, extending the anticipated pre-publishing in the *Canada Gazette*, Part I, from 2012 to 2017.

Progress toward mitigation of the risks associated with this recommendation has been slow. Such extended delays have prompted the TSB to add an item to its key safety issues Watchlist that calls for both TC and the Government of Canada to move towards an improved and accelerated process for taking action on TSB recommendations.

While TC's proposed regulatory changes are reasonable, the protracted delays are not.

Therefore, the response to Recommendation A94-04 is assessed as **Unsatisfactory**.

Transport Canada's response to Recommendation A94-04 (October 2017)

TC agrees in principle with the recommendation.

It is anticipated that the proposed regulations that address updated flight recorder requirements will be pre-published in the *Canada Gazette*, Part I, in the fall of 2017.

TSB reassessment of Transport Canada's response to Recommendation A94-04 (June 2018)

During previous reassessments, Recommendation A94-04 was linked to the implementation of Recommendation A99-02. However, Recommendation A99-02 addresses the requirement for 2-hour cockpit voice recorders (CVRs), while this recommendation is broader and directed at the timely implementation of updated flight recorder (flight data recorder [FDR] and CVR) requirements.

TC's proposed amendments to the *Canadian Aviation Regulations* (CARs), which were pre-published in the *Canada Gazette*, Part I, in December 2017, only partially address the flight recorder requirements introduced by the International Civil Aviation Organization (ICAO) in 2010. If these amendments are implemented by 2019, the regulations will not come into effect until 2023, which is 7 years after the ICAO effective date of 1 January 2016, and 13 years since the introduction of the ICAO requirements.

The following is a list of ICAO Annex 6 FDR/CVR requirements, which have been introduced since November 2010 and have not been addressed by TC:

Date	Requirements
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18 November 2010	<ul style="list-style-type: none"> • CVR and FDR requirements changed to “all turbine-engined aeroplanes” for aircraft issued a type certificate after 1 January 2016 (Transport Canada only addresses multi-engine turbine aeroplanes) • FDR or lightweight FDR are required for all turbine aircraft 5700 kg or less and are issued a type certificate after 1 January 2016 • discontinue use of Mag tape and wire CVRs by 1 January 2016 • discontinue use of Mag tape and wire FDRs by 1 January 2016 • all CVRs to be 2-hour duration by 1 January 2016 • sampling and recording rates were increased for some FDR parameters for aircraft issued a type certificate after 1 January 2016 • discontinue use of analogue and photographic FDRs by 1 January 2012
15 November 2013	<ul style="list-style-type: none"> • CVR requirements for all turbine-engine aeroplanes between 2250 kg to 5700 kg for type certified aircraft after 1 January 2016 (<i>Canada Gazette</i>, Part I, only covers multi-engine, 6 or more passengers) • 90-day underwater locator beacon (ULB) for all FDRs and CVRs by 1 January 2018 • requirement to install low frequency 30-day ULB on airframe by 2018 • Note: <i>Canada Gazette</i>, Part I, allows for a CVR not to have a ULB, which is non-compliant with ICAO, Annex 6
10 November 2016	<ul style="list-style-type: none"> • requirement for 25-hour CVR for new manufactured aircraft > 27 000 kg after 1 January 2021 • requirement aeroplanes > 27 000 kg and type certified after 1 January 2021 to be equipped with a means to recover flight recorder data in a timely manner • introduction/authorization to install automatic deployable flight recorders

The current flight recorder requirements in the CARs are out of date and non-compliant with ICAO requirements. The Notice of Proposed Amendment (NPA) for the CVR amendments published in the *Canada Gazette*, Part I, was initiated in 2011 and will take effect in 2023, at the earliest, if implemented by 2019. TC lacks a process to implement the updating of flight recorder requirements in a timely manner.

TC's response does not contain details of any actions, which have been taken or proposed, to change the processes to facilitate the timely Canadian implementation of updated flight recorder requirements.

Therefore, the Board considers the response to Recommendation A94-04 to be **Unsatisfactory**.

Transport Canada's response to Recommendation A94-04 (November 2018)

TC agrees in principle with the recommendation.

TC is exploring options for developing and improving the use and implementation of flight data recording devices.

In February 2018, TC led a focus group of representatives from the aviation industry to address TSB Recommendation A13-01 related to Flight Data Recorders (FDRs) and Lightweight Data Recorders (LDRs). This work included extensive consultations with industry stakeholders and

thorough policy analysis of the possible approaches to expanding safety data collection in Canadian aviation.

TC is holding another focus group on November 6-7 th , 2018, to continue discussions. As part of this work, two approaches are being considered:

1. Voluntary installation of FDRs and LDRs: TC and industry will further explore the voluntary installation of FDRs and LDRs, in particular, examining how the voluntary approach would be successfully implemented. This could include a TC-led Advisory Circular (AC) and ongoing guidance to operators looking to improve their data collection; and
2. Incorporation of FDRs or LDRs into newly-manufactured aircraft: The incorporation of FDRs and LDRs would regulate manufacturers to incorporate these devices into all new generation aircraft.

TC considers that these initiatives will help to address the recommendation and we will update the TSB as our work continues.

TSB reassessment of Transport Canada's response to Recommendation A94-04 (March 2019)

In its response, Transport Canada (TC) provides information on the work that has been done to date through the Focus Group responsible to address TSB Recommendation A13-01, a recommendation since closed and superseded by Recommendation A18-01.

The objective of the TC Focus Group is to address the possibility of expanding the use of flight recorders to smaller Canadian commercial aircraft. TC's response does not contain details of any actions, which have been taken or proposed, to address Recommendation A94-04, which calls for streamlining of the processes to facilitate the timely Canadian implementation of updated flight recorder requirements.

This recommendation was issued over 24 years ago. The Board is concerned with the protracted delays in addressing the safety deficiency identified in Recommendation A94-04.

Of note, in addition to the list of International Civil Aviation Organization (ICAO) Annex 6 requirements not yet addressed by TC (see TSB reassessment June 2018), new ICAO Annex 6 requirements became effective on 8 November 2018. The current flight recorder requirements in the *Canadian Aviation Regulations* continue to be out of date and non-compliant with international requirements.

Therefore, the response to Recommendation A94-04 remains **Unsatisfactory**.

Transport Canada's response to Recommendation A94-04 (October 2019)

Transport Canada (TC) agrees in principle with this recommendation. While we endeavor to update regulatory requirements in a timely manner, TC works within a regulatory framework that includes important processes that ensure the cost-benefits of new regulations and the needs of multiple stakeholders are considered.

Working within these processes, TC has made significant progress recently in updating flight recorder requirements as described in the following three updates to recommendations A99-02, 99-03 and A18-01.

TSB reassessment of Transport Canada's response to Recommendation A94-04 (March 2021)

In its latest response, Transport Canada (TC) indicated that it agrees in principle with Recommendation A94-04.

In May 2019, amendments to the *Canadian Aviation Regulations* (CARs) for flight data recorders and cockpit voice recorders were published in the *Canada Gazette*, Part II. These amendments include the following requirements:

- For cockpit voice recorders (CVRs) to be capable of recording at least 2 hours (TSB Recommendation A99-02).
- For all aircraft equipped with a CVR having a recording capacity of at least 2 hours, to have a dedicated independent power supply installed adjacent or integral to the CVR, to power the CVR and the cockpit area microphone for a period of 10 minutes whenever normal aircraft power sources to the CVR are interrupted (TSB Recommendation A99-03).

These amendments will come into effect in May 2023, 29 years after the issuance of Recommendation A94-04. As relevant amendments have now been approved and published in the CARs, the Board believes that the intent of Recommendation A94-04 has been superseded by events.

Therefore, the response to Recommendation A94-04 is assessed as **Unsatisfactory**.

Next TSB action

This deficiency file is **Closed**.