TSB Recommendation A03-07

Quick access recorder data

The Transportation Safety Board of Canada recommends that regulatory authorities require, for all aircraft manufactured after 1 January 2007 which require an FDR, that in addition to the existing minimum mandatory parameter lists for FDRs, all optional flight data collected for non-mandatory programs such as FOQA/FDM, be recorded on the FDR

Air transportation safety investigation report	A98H0003
Date the recommendation was issued	27 March 2003
Date of the latest response	January 2017
Date of the latest assessment	March 2026
Rating of the latest response	Satisfactory in Part
File status	Closed

Summary of the occurrence

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.

Rationale for the recommendation

Quick access recorders (QARs) are voluntarily installed in many transport aircraft for operational purposes and routinely record far more data than the mandatory flight data recorder (FDR). The optional QAR installed on SR 111 recorded six times the amount of data recorded on the mandatory FDR. Unlike the FDR, QAR data sets can be changed by operators to accommodate their operational requirements. For example, many airlines have developed

Flight Operational Quality Assurance (FOQA) or Flight Data Monitoring (FDM) programs that rely on the increased data sets recorded by QARs.

The TSB supports FOQA and FDM programs and believes that there is no technical reason why all data, voluntarily collected for any operational purpose, should not be available for accident investigation. To achieve this, regulatory authorities need to develop regulations that protect the core parameters required for all FDRs, while also allowing FDRs to be easily augmented with additional parameters, higher sample rates, and higher resolutions without requiring re certification of the FDR and without requiring validation/calibration of parameters that are not dedicated to the FDR. The TSB believes that all FOQA/FDM data already being routinely collected should be available for safety investigations.

Therefore, the Board recommended that

> Regulatory authorities require, for all aircraft manufactured after 1 January 2007 which require an FDR, that in addition to the existing minimum mandatory parameter lists for FDRs, all optional flight data collected for non-mandatory programs such as FOQA/FDM, be recorded on the FDR.
>
> **TSB Recommendation A03-07**

Previous responses and assessments

June 2003: response from Transport Canada

In its 16 June 2003 response to Recommendation A03-07, Transport Canada (TC) provided the following comments:

- TC does not support the inclusion of all FDM data on the FDR.
- TC will continue to work with other Civil Aviation Authorities and accident investigation agencies to enhance the required FDR parameters.
- TC is concerned that, due to the sensitivity of the information, allowing FDM data to be recorded on an FDR may jeopardize the entire FDM safety initiative.

October 2003: TSB assessment of the response (Unsatisfactory)

TC's response does not support the deficiency as described in Recommendation A03-07. Rather, it states that it will work with all concerned to enhance the FDR capability as requirements change. There is no indication in its response to suggest any technical objection to supplementing the current FDR parameters. TC has expressed a concern that any attempt to capture FDM data on FDRs would jeopardize the FDM safety initiative. However, it does not explain why requiring FDRs to be easily augmented with additional parameters and routinely and readily accessed without requiring re-certification would put the FDM program at risk.

Consequently, the response is assessed as **Unsatisfactory**.

April 2004: response from Transport Canada

In response to discussions with the TSB, on 07 April 2004, TC provided the following comments:

TC states that QARs capture data that are not recorded by the FDR and that these data are potentially useful to accident investigators.

TC proposes that there are two ways to make these data available: the memory of the QAR could be designed to withstand crash scenarios or the FDR could capture these data.

TC states that technology exists to support either option, but there are significant limitations to TC's ability to force the industry to adopt the TSB recommended measure.

TC suggests that the TSB work together with other investigative authorities to identify improvements to the current parameter listing.

TC will support efforts to record and protect flight data recorded to support safety programs such as FDM.

June 2004: TSB reassessment of the response (Satisfactory Intent)

TC's initial response of 16 June 2003 expressed concern that any attempt to capture FDM data on FDRs would jeopardize the FDM safety initiative. In its recent 07 April 2004 letter, TC is supportive of the benefits of capturing QAR data to enhance accident investigation efforts. TC no longer feels that implementing Recommendation A03-07 would harm safety programs such as FDM. In addition, although TC agrees that there are no technical impediments to implementing Recommendation A03-07, it states that there are significant limitations in TC's ability to require industry to adopt the recommended measure. Instead, it suggests that the TSB needs to work with other investigative agencies to identify improvements to the current parameter listings. Additionally, TC is committed to supporting any TSB initiatives to record additional data such as QAR data in a crash-protected environment.

TSB's recommendation was drafted in the belief that the most efficient method of acquiring QAR-type data in a crash-protected environment was for regulatory authorities to initiate regulatory change. TC's response indicates that it concurs with the intent of Recommendation A03-07 and agrees that regulatory authorities have a role to play. However, the action TC proposes requires that investigative agencies better define their requirements through established channels before any regulatory action can be initiated. The course of action that TC proposes would, if successful, reduce the risks associated with this deficiency.

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

December 2005: response from Transport Canada

TC's update dated 14 December 2005 stated that future rulemaking activity will be contingent on internationally harmonized requirements.

June 2006: TSB reassessment of the response (Satisfactory Intent)

In TC's original response dated 16 June 2003, it did not support Recommendation A03-07. In a second response dated 07 April 2004, TC indicated that it concurred with the intent of Recommendation A03-07 and agreed that regulatory authorities have a role to play in bringing about the desired changes as defined by investigative agencies. In its update letter of 14 December 2005, TC has reverted to its original response that was assessed by the Board as Unsatisfactory. TC's present position states that future rulemaking activity will be contingent on internationally harmonized requirements.

It is the Board's understanding that TC remains committed to its 07 April 2004 response that, if fully implemented, will substantially reduce the risks associated with Recommendation A03-07.

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

February 2007: response from Transport Canada

TC's response reviews its previously stated position that it does not support Recommendation A03-07. While its response reiterates that any future rule-making activity will be contingent on internationally harmonized requirements, it does not provide details of any relevant harmonization activities in support of the intent of Recommendation A03-07.

July 2007: TSB reassessment of the response (Unsatisfactory)

TC has reverted to its position as originally stated in its response dated 16 June 2003. Although TC states in its most recent response that it will continue to participate in rule-making harmonization activities with other Civil Aviation Authorities, it does not indicate whether or not any of its harmonization activities are relevant to the intent of Recommendation A03-07. TC's response does not provide any new information that would suggest that TC, or any other regulator, is actively advocating strategies to address the deficiency identified in Recommendation A03-07.

As TC's action will not reduce or eliminate the deficiency, the assessment is changed to **Unsatisfactory.**

March 2008: response from Transport Canada

TC's response states that it does not support the inclusion of all FDM data on the FDR.

However, TC will continue to participate with other civil aviation authorities and accident investigation boards in the harmonized activities, which may lead to practical enhancement in the required FDR parameters listing. Future rulemaking activity will be contingent on internationally harmonized requirements.

On 10 March 2008, the Federal Aviation Administration (FAA) announced Final Rules in regards to Revisions to Cockpit Voice Recorder and Digital Flight Data Recorder Regulations.

TC considers this recommendation closed because:

of the applicability and feasibility of the recommendation given the current situation; and

any further changes in this area will take place only as a result of international regulation harmonization.

August 2008: TSB reassessment the response (Unsatisfactory)

TC's response does not provide any new information that would suggest that TC, or any other regulator, is actively advocating strategies to address the deficiency identified in Recommendation A03-07.

TC's action will not reduce or eliminate the deficiency; therefore, the assessment remains **Unsatisfactory.**

September 2009: TSB review of A03-07 deficienty file status (Satisfactory in Part)

In its latest response to Recommendation A03-07, TC states that it considers the recommendation closed and that future rulemaking activity will be contingent on internationally harmonized requirements.

Therefore, the assessment is changed to **Satisfactory in Part**.

Based on these statements, the Board concludes that no further action is planned to be taken by TC. Additionally, that any mitigation strategy to deal with the deficiency identified in Recommendation A03-07 will be the responsibility of third parties outside the direct influence of TC.

September 2011: response from Transport Canada

This recommendation is the next priority after Sept 2011 CARAC. This recommendation is under review.

March 2012: updated response from Transport Canada

Notices of Proposed Amendments addressing TSB recommendations concerning cockpit voice recorders were presented to the Canadian Aviation Regulation Advisory Council (CARAC) technical committee September 23, 2011.These proposed changes are harmonized with ICAO.

A follow-on NPA to update the requirements for Flight Data Recorders (FDRs) is planned for the 2012/2013 fiscal year. This process will examine harmonization of Canadian airworthiness regulations and standards with ICAO requirements and recommendations for FDRs.

March 2012: TSB reassessment of the response (Satisfactory Intent)

The Board is pleased that TC has decided to reactivate its review of the risks associated with Recommendation A03-07. The Board is hopeful that TC will conduct its review and share its findings with the TSB in a timely manner.

The proposed action may reduce the safety deficiency identified in Recommendation A03-07.

The response is assessed as **Satisfactory Intent**.

December 2012: response from Transport Canada

In 2013, TC plans to establish a focus group to determine how to address the changes to the international standards of International Civil Aviation Organization (ICAO) Annex 6, Parts I, II, and III relating to FDRs.

March 2013: TSB reassessment the response (Satisfactory Intent)

The Board is satisfied with TC's decision to create a focus group that will assist in the development of an implementation plan of the recently published FDR-related changes to ICAO Annex 6, Parts I, II, and III.

TSB is looking forward to timely completion of this review and, as it has in the past, the Board is willing to provide briefings or information to assist the focus group.

The proposed action may reduce the safety deficiency identified in Recommendation A03-07.

The response is considered **Satisfactory Intent.**

November 2013: response from Transport Canada

Transport Canada will take the necessary steps to comply with the ICAO standards and recommended practices (SARPs) minimum mandatory parameter lists and has chosen not to convene a focus group at this time.

In 2014, Transport Canada will conduct a cost benefit analysis to examine the feasibility and benefits of the recommended expansion. Pending the results of the cost benefit analysis, a focus group may be convened to review this recommendation.

April 2014: TSB reassessment of the response (Satisfactory Intent)

TC will comply with the minimum mandatory parameters listed in ICAO Annex 6 Standards and Recommended Practices.

Currently, the recording of any additional parameters listed in Annex 6 remains optional unless the parameter's information data source is used by an aeroplane system or the flight crew to operate the aeroplane. Nothing in the Annex 6 recommended practices encourages the use of an

FDR to record existing FOQA/FDM data already being routinely collected as stated in Recommendation A03-07.

As the proposed action may reduce the safety deficiency identified in Recommendation A03-07 the response is considered **Satisfactory Intent**.

January 2015: response from Transport Canada

Transport Canada does not agree with the recommendation. Transport Canada believes that international harmonization and compliance with the relevant ICAO SARPs by regulatory authorities is sufficient. No further updates will be provided. Transport Canada considers this recommendation closed.

TCCA has examined this issue for several years. Previously, TC had agreed with the recommendation, but has reversed that stand. The ICAO standards have significantly enlarged the list of parameters that must be recorded since this recommendation was issued. The expanded list addresses some of the concern that motivated the TSB to make this recommendation and this has significantly reduced the risk of missing important flight information during an aviation safety investigation. The issue is no longer as significant as it was in 2007.

ICAO and IATA are supporting efforts to institute global airliner tracking. This may lead to the international aviation industry implementing tracking and recording technologies that will not require on-board data storage. TCCA has limited capacity to undertake regulatory changes. Since the associated risk has been reduced, TC has decided to monitor technological progress and refrain for the time being from expending scarce resources to develop regulations that are likely to become obsolete.

March 2015: TSB reassessment of the response (Unsatisfactory)

Transport Canada's latest response states that it no longer agrees with Recommendation A03-07.

Consequently, Transport Canada has abandoned any initiative to establish a focus group and conduct a cost–benefit analysis to examine the feasibility and benefits of the recommended expansion of FDR parameters. TC's stated reliance on international harmonization and compliance with relevant ICAO SARPS is confusing in that the existing CAR 625.33 Flight Data Recorder requirements are significantly out of phase with both ICAO Annex 6 and FAR requirements. For example, the most extensive list of parameters in the current CARs (625.33, Schedule 3) contains only 42 parameters as compared to the FAA/ICAO requirement for 88 parameters. In the case of the FAR requirements, Canadian regulations regarding FDR parameters requirements have not been harmonized since 1997. Additionally, if, as Transport Canada states, harmonization is the key, it fails to reveal what rulemaking initiative would allow the CARs to be harmonized with the FARs and ICAO standards.

The Board encourages Transport Canada's support of ICAO's initiative to adopt a standard for global tracking of commercial aircraft. Concurrently, the Board is puzzled by TC's strategy to implement a harmonization plan that lacks clarity while awaiting the advent of a technology that it believes may eclipse the requirement for FDRs. The Board is confident that the FDR requirement will continue for the foreseeable future and, as a minimum, the applicable CARs need to correspond with both ICAO and FAR requirements.

As Transport Canada asserts that it considers this matter closed and will no longer provide updates, it can be concluded that Transport Canada plans no further action to address the deficiency highlighted in Recommendation A03-07.

Therefore, the assessment rating has been changed to **Unsatisfactory**.

November 2015: response from Transport Canada

As per the 2014 update, Transport Canada does not agree with the recommendation.

2014 update:

Transport Canada believes that international harmonization and compliance with the relevant ICAO SARPs by regulatory authorities is sufficient.

March 2016: TSB reassessment of the response (Unsatisfactory)

Transport Canada (TC)'s latest response repeats its position stated in 2014. TC has not explained how it sees its current standards as being harmonized with the ICAO/FAA requirements. Consequently, with no new information available, a meaningful assessment is not possible.

The Board maintains its position that a residual risk exists in that valuable data not currently captured in the FDR's crash-protected memory is being lost to investigations. Additionally, it believes that enhancing regulations that allow FDRs to be easily augmented with additional parameters, increased sample rates, and higher resolutions without requiring re-certification of the FDR is achievable. Unfortunately, TC no longer supports such an initiative.

Therefore, the assessment rating remains **Unsatisfactory**.

January 2017: response from Transport Canada

TC does not agree with the recommendation. TC believes that international harmonization and compliance with the relevant ICAO SARPs are more appropriate than taking unilateral action on such a complex issue.

March 2017: TSB reassessment of the response (Unsatisfactory)

TC's latest response repeats its previously stated position on Recommendation A03-07. While it does not agree with the recommendation and plans no further action, TC has yet to explain, in sufficient detail, how its current standards harmonize with the ICAO/FAA requirements.

Therefore, the response to Recommendation A03-07 is assessed as **Unsatisfactory**.

Latest response and assessment

March 2026: TSB assessment of the overall response (Satisfactory in Part)

In 2003, the Board issued Recommendation A03-07, calling on Transport Canada (TC) to require that, for all newly manufactured aircraft requiring a flight data recorder (FDR), optional flight operational quality assurance (FOQA) or flight data monitoring (FDM) parameters also be recorded on the FDR, in addition to the minimum mandatory parameters. The intent was to improve the availability of flight data for safety investigations and operational analysis.

Since the recommendation was issued, TC has maintained that it will not introduce specific regulatory requirements in this area, instead prioritizing alignment with standards set by the International Civil Aviation Organization (ICAO).

ICAO Annex 6 now specifies minimum FDR recording requirements that vary by aircraft type, size, and certification date. These requirements have evolved over time—from a minimum of 32 parameters for aeroplanes with a maximum certificated take-off mass of over 27 000 kg, to at least 78 parameters for aeroplanes with a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness was first issued on or after 1 January 2005, and to at least 82 parameters for aeroplanes with a maximum certificated take-off mass of over 5 700 kg for which the application for type certification was submitted on or after 1 January 2023.[1] Annex 6 also requires data retention for a minimum duration (typically the last 25 hours of operation).

However, Annex 6 does **not** require recording of all FOQA/FDM parameters. It establishes minimum FDR parameter requirements intended to support accident and incident investigation and flight reconstruction. Many parameters that would be useful for comprehensive FDM programs —such as autothrust inputs, cabin or door status, detailed engine or system health, or aircraft configuration data—fall outside these minimum requirements. Consequently, there is no international requirement for an FDR to record these additional parameters, though States and operators may voluntarily choose the parameters to be recorded.

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1 International Civil Aviation Organization (ICAO), *Annex 6 to the Convention on International Civil Aviation – Operation of Aircraft – Part 1 – International Air Transport – Aeroplanes*, Twelfth Edition (July 2022), available at https://elibrary.icao.int/reader/290990/&returnUrl%3DaHR0cHM6Ly9lbGlicmFyeS5pY2FvLmludC9leHBsb3JlO3NlYXJjaFRleHQ9YW5uZXgIMjA2O21haW5TZWFyY2g9MTt0aGVtZU5hbWU9Qmx1ZS1UaGVtZQ%3D%3D?productType=eBook (last accessed on 22 April 2026).

After more than 22 years of monitoring this recommendation, the Board recognizes that modern aircraft now record substantially more parameters than in 2003 and that voluntary FDM programs are widely used. Nonetheless, the systematic recording of all optional FOQA/FDM data on an FDR has not been adopted internationally and is unlikely to be implemented in Canada.

Given the evolution of aircraft technology, the use of FDM programs, and the absence of international consensus on mandatory recording of all optional parameters, the Board concludes that no further progress on this recommendation is expected. Since TC has confirmed that no further action is planned, the risk associated with the safety deficiency identified in Recommendation A03-07 remains partially addressed.

Therefore, the Board considers the overall response to be **Satisfactory in Part**.

File status

The Board recognizes that modern aeroplanes routinely capture significantly more operational data through onboard systems and that FDM programs are now widely used across the industry. These developments have reduced the risks associated with limited flight data.

Given the age of the recommendation, advances in aircraft data recording capabilities, and TC's consistent position that no regulatory changes will be made, the Board considers the risk associated with the safety deficiency identified in Recommendation A03-07 to have been partially addressed; however, the residual risk is considered to be low.

This deficiency file is **Closed**.