



REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A00-06

Pilot decision making

Background

The aircraft, a Pilatus PC-12, serial number 151, was on a scheduled domestic flight from St. John's, Newfoundland, to Goose Bay, Labrador, with the pilot, a company observer, and eight passengers on board. Twenty-three minutes into the flight, the aircraft turned back towards St. John's because of a low oil pressure indication. Eight minutes later, the engine (Pratt & Whitney PT6A-67B) had to be shut down because of a severe vibration. The pilot then turned towards Clarenville Airport, but was unable to reach the airfield. The aircraft was destroyed during the forced landing in a bog one and a half miles from the Clarenville Airport. The pilot, the company observer, and one passenger sustained serious injuries.

The Board concluded its investigation and released report A98A0067 on 29 March 2000.

TSB Recommendation A00-06 (March 2000)

The accident pilot did not have formal pilot decision-making (PDM) training, company standard operating procedures (SOPs), or PC-12 simulator training to help him formulate his decision. Without a systemic approach to improving PDM, accidents resulting from ineffective decisions in complex situations will continue to affect commercial operations. The Board believes that improved formal PDM training is a necessity for all commercial pilots. The Board also believes that SOPs and an increased emphasis on appropriate decision making throughout pilot training and during all of a pilot's flying-related activities will serve to reduce the occurrence of PDM-related accidents. Therefore, the Board recommended that:

The Department of Transport improve the quality of pilot decision making in commercial air operations through appropriate training standards for crew members.

TSB Recommendation A00-06

Transport Canada's response to Recommendation A00-06 (June 2000)

Transport Canada's (TC) response, dated 21 June 2000, indicated that TC agrees that the generic PDM course currently offered to pilots and called for in the standard for low visibility can be improved for the purpose of single-engine instrument flight rules (SEIFR) conducted at high altitude in a pressurized aeroplane such as the PC-12. TC will review the training standard, and revise the standard as necessary through the Canadian Aviation Regulation Advisory Council (CARAC) consultative process.

TSB assessment of the response to Recommendation A00-06 (September 2000)

In its reply, TC indicated that it agrees that the generic PDM course currently offered to pilots and called for in the standard for low visibility can be improved for the purpose of SEIFR conducted at high altitude in a pressurized aeroplane such as the PC-12. TC will review the training standard, and revise the standard as necessary through the CARAC consultative process.

Given that it will not be known what safety action TC intends to take until after it completes its review and then consults with the CARAC, the response is considered **Satisfactory in Part**.

Transport Canada's response to Recommendation A00-06 (December 2005)

TC reviewed this recommendation and drafted Notice of Proposed Amendment (NPA) 2001-134 and presented the NPA to the CARAC for consultation. NPA 2001-134 affects CAR 703.107(1) as follows:

Standard Operating Procedures

(1) Every air operator shall, for each of its aircraft, establish and maintain standard operating procedures that enable the crew member(s) to operate the aircraft within the limitations specified in the aircraft flight manual and that meet the Commercial Air Services Standards.

Being accepted through the CARAC process, the amendment is currently with the Department of Justice awaiting formal promulgation following *Canada Gazette* activities.

TSB reassessment of the response to Recommendation A00-06 (June 2006)

TC's activity update received on 14 December 2005 indicates that it has presented NPA 2001-134 to the CARAC for consultation. The NPA affects Section 703.107(1) of the *Canadian Aviation Regulations* as follows:

Standard Operating Procedures

(1) Every air operator shall, for each of its aircraft, establish and maintain standard operating procedures that enable the crew member(s) to operate the aircraft within the limitations specified in the aircraft flight manual and that meet the Commercial Air Services Standards.

The NPA has been approved by the CARAC. The amendment is currently with the Department of Justice awaiting formal promulgation following *Canada Gazette* activities. The proposed action, if fully implemented, will reduce the safety deficiency described in A00-06.

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

Transport Canada's response to Recommendation A00-06 (February 2007)

TC's activity update received 07 February advises that the NPA has been approved by the CARAC. The amendment is currently with the Department of Justice awaiting formal promulgation following the *Canada Gazette* process.

TSB reassessment of the response to Recommendation A00-06 (July 2007)

The proposed action, if fully implemented, will reduce the safety deficiency described in A00-06.

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

Transport Canada's response to Recommendation A00-06 (March 2008)

In its response of 6 March 2008, TC states that Notices of Proposed Amendment (NPAs) 2001-134 and 2001-135 were approved by the Canadian Aviation Regulation Advisory Council (CARAC) consultation process in January 2002, and that the NPAs are still with the Department of Justice for legal drafting and publication in the *Canada Gazette*.

TSB reassessment of the response to Recommendation A00-06 (August 2008)

The Board is concerned that, until the changes to regulations are put into effect, the deficiency continues to exist. The proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the safety deficiency as described in Recommendation A00-06

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

Transport Canada's response to Recommendation A00-06 (February 2010)

In its response of 15 February 2010, TC essentially repeats the statement made in 2008 that its CARAC-approved NPAs 2001-134 and 2001-135 remain at the Department of Justice (DOJ RU file # 10000-654 refers) for regulation drafting. The response offers no explanation for the length of time taken to complete this process.

TSB reassessment of the response to Recommendation A00-06 (July 2010)

According to TC's response, the Department of Justice is currently processing TC NPAs that were started in 2001. The Board remains concerned that, until the regulatory changes proposed by TC are enacted; the deficiency identified in Recommendation A00-06 continues to exist. The proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the safety deficiency as described in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (January 2011)

TC's most recent update states that its A00-06-related NPAs have been through the CARAC consultation process and are currently contained within a Department of Justice file. TC further states that this file will be drafted upon the completion of other priority files.

TSB reassessment of the response to Recommendation A00-06 (March 2011)

According to TC's response, its proposed regulatory changes remain with the Department of Justice awaiting the completion of other higher priority files. Previous TC A00-06 updates indicate that this file has been with Department of Justice since 2005.

The Board is concerned about TC's failure to progress this file with the Department of Justice. Until the regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A00-06 will continue to exist. The proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the safety deficiency as described in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (May and September 2011)

May 2011 input

TC will take appropriate action to elevate these NPA's as a priority in order for the department of Justice to proceed with the drafting.

September 2011 update

NPAs on Pilot Decision Making (PDM) have been elevated to the Transport Canada list of regulatory priorities. A cross reference is to be made on recommendations residing in CRM. (A09-02, A07-01, A07-03, A07-05, A00-06)

A focus group will be initiated in fall 2011 with regulatory proposals to be ready for consultation in spring 2012. NPA's for recommendation A00-06 will be revalidated to complement proposals for CRM.

TSB reassessment of the response to Recommendation A00-06 (March 2012)

TC indicated that it will take action to elevate NPAs on Standard Operating Procedures (NPA 2001-134 and 2001-135) as a priority in order for the Department of Justice to proceed with the drafting.

TC also indicated that NPAs on Pilot Decision Making (PDM) have been elevated on its list of regulatory priorities. It is understood that in drafting these NPAs, TC will cross reference other TSB recommendations related to PDM and CRM.

Until all regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A00-06 will continue to exist. The proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (December 2012)

A Focus Group met in January 2012, and the resulting recommendations were accepted by the Civil Aviation Regulatory Committee in May 2012. TC's intent is to incorporate threat and error

management (TEM) and Pilot Decision Making (PDM) into draft regulations and standards as appropriate, for inclusion in Subparts 702, 703, 704, and 705 of the CARs. Associated recs are A07-03 and A09-02.

On 07 December 2012, the following update was received:

TC cannot commit to a timeline for the 3 CRM recommendations until such time the proposed amendments have been developed. Once this is done, TC will have an appreciation for the amount of work required which will be entailed in a work plan accordingly.

TSB reassessment of the response to Recommendation A00-06 (March 2013)

Until all regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A00-06 will continue to exist. However, the proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (November 2013)

This item remains a regulatory priority, and work to amend the Standard has begun. Recommendation A00-06 will be addressed in conjunction with the work being done on crew resource management (CRM) as described in Transport Canada's response to Recommendation A09-02.

TSB reassessment of the response to Recommendation A00-06 (April 2014)

Until all regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A00-06 will continue to exist. However, the proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (January 2015)

Transport Canada agrees with the intent of the recommendation. Work continues on the development of Standards and Guidance material for Crew Resource Management (CRM) and updated Pilot Decision Making (PDM) to be incorporated in the CRM modules. Public consultation on proposed amendments to the standards is underway, and the standards are expected to come into effect in late 2015.

TSB reassessment of the response to Recommendation A00-06 (March 2015)

The Board issued this recommendation 15 years ago. Until all regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A00-06 will continue to exist. However, the proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (November 2015)

Transport Canada agrees with the intent of the recommendation.

Work continues on the development of Standards for Crew Resource Management (CRM). A Notice of Proposed Amendment on CRM Standards was developed and will be published in 2016.

TSB reassessment of Transport Canada's response to Recommendation A00-06 (March 2016)

The Board issued this recommendation 16 years ago. Until all regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A00-06 will continue to exist. However, the proposed regulatory changes, if fully implemented, will substantially reduce or eliminate the risks associated with the safety deficiency identified in Recommendation A00-06.

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

Transport Canada's response to Recommendation A00-06 (January 2017)

TCCA agrees with the intent of this recommendation. TCCA proposes to go beyond the scope of the recommendation and require crew resource management (CRM) training for CAR 702 (Aerial work) operations as well. A revised Notice of Proposed Amendment for CRM was posted to the CARAC Activity Reporting System under Activity #2014-021 and emailed to all CARAC stakeholders on May 9, 2016.

The new CRM Standard will be published in May/June 2017, together with guidance material for industry in the form of an Advisory Circular being published at the same time. Industry stakeholders will be briefed before publication.

The new standard will come into effect 30 days after publication.

TSB reassessment of Transport Canada's response to Recommendation A00-06 (March 2017)

TC's latest response suggests that its revised *Notice of Proposed Amendment* (NPA 2014-021) addresses the deficiency identified in Recommendation A00-06. The NPA states that TC's current framework for CRM training does not reflect many contemporary CRM training concepts. The NPA's objective is to integrate such concepts into commercial aviation crew training programs. Additionally, the proposed amendments will see a broader application of these updated CRM training requirements to include *Commercial Air Service Standards* (CASS) subparts 722, 723, 724, and 725.

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 toward an improved and accelerated process for taking action on TSB recommendations.

The Board is encouraged that amendments to the CASS, and guidance material for industry, are planned to be published in May/June 2017 and come into effect 30 days following their publication.

The Board is pleased that the intent of NPA 2014-021 is to update CRM training standards across all CASS, including Aerial Work operations, which were not included in the original recommendation. Consequently, if fully implemented, the proposed changes should serve to mitigate the risks identified in Recommendation A00-06.

However, until the new CRM standards are fully implemented, the risks associated with the safety deficiency identified in Recommendation A00-06 will continue to exist.

Therefore, the response to Recommendation A00-06 is assessed as **Satisfactory Intent**.

Transport Canada's response to Recommendation A00-06 (December 2017)

TC agrees with the intent of the recommendation.

The new standards for the crew resource management (CRM) have been published on the CARAC Activity Reporting website on 28 July 2017 and can be found in the following locations: <http://www.wapps.tc.gc.ca/Saf-Sec-Sur/2/NPA-APM/actr.aspx?id=15&aType=1&lang=eng> and <http://www.wapps.tc.gc.ca/Saf-Sec-Sur/2/NPA-APM/actr.aspx?id=15&aType=1&lang=fra> (last link on the page entitled 'Standard - Crew Resource Management').

Industry stakeholders were briefed prior the publication and the new standards will come into effect on 31 January 2019.

The amendments will be incorporated into the actual standards on the CARs website as part of the December 2018 CARs amendment (30 days before the amendments become effective).

In the meantime, there will be a new link added to the CARs Index page for 'Approved Standards Not Yet in Effect' when the next CARs amendment is released. The new link will take you to a page providing the text of the amended/new provisions that are not yet in effect. The following link leads to the CARs Index page: <http://www.tc.gc.ca/eng/acts-regulations/regulations-sor96-433.htm>.

Transport Canada has no further activities planned for this recommendation.

TSB reassessment of Transport Canada's response to Recommendation A00-06 (February 2018)

TC's response indicates that the new crew resource management (CRM) standards will come into effect on 31 January 2019, under subparts 722, 723, 724 and 725 of the *Commercial Air Service Standards* (CASS), and apply to aerial work, air taxi, commuter and airline operators. Under these new standards, air operators are required to provide contemporary CRM training to flight crews, flight attendants, dispatchers/flight followers, ground crew and maintenance personnel, on an initial and annual basis.

These new standards will integrate contemporary CRM by applying threat and error management (TEM) concepts for commercial air operators. In order to validate CRM skills, the new standards also require an assessment for non-technical skills, such as cooperation;

leadership and managerial skills; situational awareness; and decision making. The training will provide knowledge and skills which can assist flight crews in recognizing risks, such as those associated with conducting approaches in deteriorating weather conditions.

The new CRM standards have been published on the Canadian Aviation Regulation Advisory Council (CARAC) Activity Reporting website. Additionally, TC published Advisory Circular 700-042, which provides guidance to the industry for compliance with the new standards, as well as an article in its Aviation Safety Letter, Issue 4/2017, regarding the need for commercial air operators to prepare for the new CRM standards.

The Board believes that the actions taken by TC will substantially reduce the risk associated with the safety deficiency identified in Recommendation A00-06, once the new CRM standards come into effect.

Therefore, the Board considers the response to Recommendation A00-06 to be **Fully Satisfactory**.

Next TSB action

This deficiency file is **Closed**.