



REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A09-02

Crew resource management training

Background

On 07 January 2007, Transwest Air Flight 350 (TW350), a Beech A100 King Air (registration C-GFFN, serial number B190), departed La Ronge, Saskatchewan, at 1930¹, under instrument flight rules to Sandy Bay, with two flight crew members and two emergency medical technicians aboard. TW350 was operating under Part VII, Subpart 3, Air Taxi Operations, of the Canadian Aviation Regulations. At 1948, air traffic control cleared TW350 out of controlled airspace via the Sandy Bay Runway 05 non-directional beacon approach. The crew flew the approach straight-in to Runway 05 and initiated a go-around from the landing flare. The aircraft did not maintain a positive rate of climb during the go-around and collided with trees just beyond the departure end of the runway. All four occupants survived the impact and evacuated the aircraft. The captain died of his injuries before rescuers arrived. Both emergency medical technicians were seriously injured, and the first officer received minor injuries. The aircraft sustained substantial damage from impact forces and was subsequently destroyed by a post-impact fire. The accident occurred at 2002 during the hours of darkness.

The investigation concluded that ineffective crew resource management (CRM) contributed to the accident. Examples of ineffective CRM included trans-cockpit authority gradient, communications, problem solving and decision making, conflict resolution, and operating practices that were substantial deviations from SOPs. The crew members' inability to work effectively as a team to avoid, trap, or mitigate crew errors encountered during the flight is likely, in part, because they had not received recent CRM training.

Ineffective CRM also affected the performance of other King Air pilots employed by the company. None of the company's King Air pilots had received recent CRM training. It is likely that recent CRM training would have assisted the crew of TW350 and Transwest Air's other King Air pilots in managing risks present during flight to an acceptable level.

Many air taxi and commuter operators provide their pilots with CRM training voluntarily, although there is currently no regulatory requirement for them to do so. However, some CAR 703 air taxi and CAR 704 commuter operators do not provide their pilots with any initial or recurrent CRM training, and others do not provide recurrent CRM training on an annual basis.

¹ All times are Central Standard Time (Coordinated Universal Time minus six hours).

The investigation concluded that some operators are unlikely to provide CRM training in the absence of a regulatory requirement to do so. Therefore, some commercial pilots may be unprepared to avoid, trap, or mitigate crew errors encountered during flight.

The Board released its report (A07C0001) on 14 October 2009.

TSB Recommendation A09-02 (October 2009)

CRM training has developed over the years as an effective tool. Modern, well-designed CRM training now includes such things as the concept of threat and error management. This accident has demonstrated that current defences are less than adequate. In light of the risks associated with the absence of recent CRM training for air taxi and commuter crew members, the Board recommends that:

The Department of Transport require commercial air operators to provide contemporary crew resource management (CRM) training for Canadian Aviation Regulations (CARs) subpart 703 air taxi and CARs subpart 704 commuter pilots.

TSB Recommendation A09-02

Transport Canada's response to Recommendation A09-02 (January 2010)

Transport Canada has accepted the recommendation in principle and in accordance with the Cabinet Directive on Streamlining Regulations, the rulemaking process will commence with a more detailed risk assessment. Transport Canada is expecting to present the risk assessment and supporting recommendation to the Civil Aviation Regulatory Committee (CARC) in the spring of 2010. The resulting recommendation from CARC will trigger the rulemaking process.

TSB assessment of the response to Recommendation A09-02 (March 2010)

Transport Canada's written response to the recommendation indicates that it accepts the recommendation in principle, and intends to conduct a more detailed risk assessment. The risk assessment is expected to be complete in the spring of 2010, with resulting recommendations to be presented to the CARC to trigger the rulemaking process. However, Transport Canada has not yet issued or recommended specific courses of action that, if implemented, would reduce or eliminate the deficiency identified in Board Recommendation A09-02.

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

Transport Canada's response to Recommendation A09-02 (January 2011)

TC completed the risk assessment. The CARC accepted a balanced approach that included acceptance of TSB Recommendation A09-02, regulatory action, training, and guidance. The project plan is currently being reviewed in the context of existing priorities.

TSB reassessment of the response to Recommendation A09-02 (March 2011)

The risk assessment conducted by TC validated the TSB's finding as to risk regarding the absence of recent CRM training and broadened the scope of the safety deficiency to include commercial single-pilot operations. The risk assessment also concluded that current training issues extended beyond CARs 703 and 704 pilots, and recommended better defining training requirements and integrating contemporary CRM into existing training requirements.

TC has made progress in implementing TSB Recommendation A09-02. The accepted course of action, if implemented, would reduce or eliminate the deficiency identified in Board Recommendation A09-02.

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

Transport Canada’s response to Recommendation A09-02 (May and September 2011)

May 2011

ToRs for the creation of a Working Group will be presented at the Sept. 2011 CARAC Technical Committee meeting.

September 2011 update

On September 19th, the Civil Aviation Regulatory Committee directed that a Focus group be established as soon as possible in the fall to address this issue.

TSB reassessment of the response to Recommendation A09-02 (March 2012)

The newly formed focus group met for the first time on 23 January 2012. TC has continued to make progress in implementing TSB Recommendation A09-02. The accepted course of action, if implemented, would substantially reduce or eliminate the deficiency identified in Board Recommendation A09-02.

The response is considered **Satisfactory Intent**.

Transport Canada’s response to Recommendation A09-02 (December 2012)

On April 24, 2012, CARC determined that contemporary CRM training standard would be developed for 702, 703, 704 and 705 to include the Threat and Error Management Model (TEM) to enhance flight crew’s ability to assess conditions and make appropriate decisions in critical situations. Associated recs are A00-06 and A07-03

TSB reassessment of the response to Recommendation A09-02 (March 2013)

TC has continued to make progress in implementing TSB Recommendation A09-02. However, until the new training standards are developed and implemented, the deficiency identified in Recommendation A09-02 will continue to exist.

The accepted course of action, if implemented, would substantially reduce or eliminate the deficiency identified in Board Recommendation A09-02. However, for the present, the action has not been sufficiently advanced to reduce the risks to transportation safety.

The response is considered **Satisfactory Intent**.

Transport Canada’s response to Recommendation A09-02 (November 2013)

This item remains a regulatory priority, and work to amend the Standard has begun.

Based on the findings and recommendations of the Crew Resource Management (CRM) focus group and the 2012 risk assessment, Transport Canada is developing a project plan, with the following expected to be accomplished over the next year:

- Develop project plan and timelines for 702, 703, 704 and 705 CRM, including information to help determine whether a single rule set or keeping distinct requirements in individual parts is best;
- Consolidate existing information into an Advisory Circular; and
- Publish Advisory Circular following consultation with regional staff.

TSB reassessment of the response to Recommendation A09-02 (April 2014)

Since the last time this recommendation was assessed, the TSB has released the final report into the crash of FAB6560 in Resolute Bay, Nunavut (A11H0002). That investigation identified ineffective crew interactions as a significant contributing factor to the accident. The crew's CRM training was abbreviated and based on the current, outdated TC standard. The Board issued a safety concern to the effect that without a comprehensive and integrated approach to CRM by TC and aviation operators, flight crews may not routinely practice effective CRM.

This recommendation was first issued in 2009. The project plan has been under development since December 2012. TC progress during the past 12 months in implementing TSB Recommendation A09-02 and proposed actions are preparatory in nature, and changes to regulations and standards are unlikely to occur in a timely manner. Given the number of fatal accidents involving ineffective CRM (including A09A0016), the Board is concerned about the slow pace of action to address this recommendation.

If implemented, the proposed course of action will eventually substantially reduce or eliminate the safety deficiency identified in Board Recommendation A09-02. In the interim, this safety deficiency will continue to exist.

The response is considered **Satisfactory Intent**.

Transport Canada's response to Recommendation A09-02 (January 2015)

Transport Canada agrees with the intent of this 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 A09-02 (March 2015)

The Board is encouraged that action on this recommendation is nearing completion. The proposed course of action should substantially reduce or eliminate the safety deficiency identified in Board Recommendation A09-02. Until the standards are amended and fully implemented, this safety deficiency will continue to exist.

The response is considered **Satisfactory Intent**.

Transport Canada's response to Recommendation A09-02 (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 the response to Recommendation A09-02 (March 2016)

Transport Canada (TC) continues to make progress toward implementation of this recommendation. Until all regulatory changes proposed by TC are enacted, the deficiency identified in Recommendation A09-02 will continue to exist. However, the proposed regulatory changes, if fully implemented, should reduce the risks associated with the safety deficiency identified in Recommendation A09-02.

The Board considers the response to the recommendation to indicate **Satisfactory Intent**.

Transport Canada's response to Recommendation A09-02 (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 A09-02 (March 2017)

TC's latest response suggests that its revised *Notice of Proposed Amendment* (NPA 2014-021) addresses the deficiency identified in Recommendation A09-02. 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.

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 A09-02.

However, until the new CRM Standards are fully implemented, the risks associated with the safety deficiency identified in Recommendation A09-02 will continue to exist.

Therefore, the response to Recommendation A09-02 is assessed as **Satisfactory Intent**.

Transport Canada's response to Recommendation A09-02 (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 A09-02 (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 A09-02, once the new CRM standards come into effect.

Therefore, the Board considers the response to Recommendation A09-02 to be **Fully Satisfactory**.

Next TSB action

This deficiency file is **Closed**.