



REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A09-04

Knowledge of visual glide slope indicator system limitations

Background

On 11 November 2007, a Bombardier Global 5000 (registration C-GXPR, serial number 9211), operated by Jetport Inc., departed Hamilton, Ontario, for Fox Harbour, Nova Scotia, with two crew members and eight passengers on board. At approximately 1434 Atlantic standard time, the aircraft touched down seven feet short of Runway 33 at the Fox Harbour aerodrome. The main landing gear was damaged when it struck the edge of the runway, and directional control was lost when the right main landing gear collapsed. The aircraft departed the right side of the runway and came to a stop 1000 feet from the initial touchdown point. All occupants evacuated the aircraft. One crew member and one passenger suffered serious injuries; the other eight occupants suffered minor injuries. The aircraft sustained major structural damage.

The Board concluded its investigation and released report A07A0134 on 10 November 2009.

TSB Recommendation A09-04 (November 2009)

The occurrence crew was not aware of the limitations of the visual glide slope indicator (VGSI) system in use at the Fox Harbour aerodrome. The investigation determined that this crew was not an exception. While most pilots are aware that different VGSI systems are in use, they are not aware of their limitations, nor are they aware of the fact that some VGSI systems may be inappropriate for a given type of aircraft.

This lack of awareness can lead pilots to rely on VGSI guidance that is unsuitable for the aircraft type they are operating. Without training to improve crew awareness of this issue, there continues to be an unacceptable level of risk to crews and the travelling public.

Therefore, the Board recommended that

the Department of Transport require training on visual glide slope indicator (VGSI) systems so pilots can determine if the system in use is appropriate for their aircraft.

TSB Recommendation A09-04

Transport Canada's response to Recommendation A09-04 (February 2010)

Pilots are trained on visual slope indicator systems during their private and commercial courses. When pilots take training for their night rating, further training on visual slope indicator systems takes place.

Transport Canada (TC) has reviewed the training and determined that additional training is not required. However, TC will revise the Aeronautical Information Manual (AIM) section on Approach Slope Indicator Systems with an emphasis on the following:

- pilots must ensure that the approach slope indicator systems are appropriate for the given aircraft type based on eye-to-wheel height (EWH) information provided by the aircraft manufacturer;
- the aircraft manufacturer should be contacted to determine the EWH information for the given aircraft type, if this information is not already available in the aircraft flight manual (AFM) or other authoritative aircraft manual (for example, Flight Crew Operating Manual (FCOM)); and
- failure to assess the EWH and approach slope indicator system compatibility could result in decreased terrain clearance margin and in some cases even premature contact with terrain.

TC will also produce an advisory circular to highlight the above information to flight crews. These actions are to be completed by spring of 2010.

TSB assessment of Transport Canada's response to Recommendation A09-04 (May 2010)

In its response, TC indicates that VGSI training is already provided to pilots at different stages of their training. While it will be providing additional information on VGSI in its AIM and producing an advisory circular, it has determined that additional training is not required.

However, even if VGSI training is already provided to pilots at different stages of their training, the investigation determined that, while most pilots are aware that different VGSI systems are in use, they are not aware of their limitations, nor are they aware of the fact that some VGSI systems may be inappropriate for a given type of aircraft. This indicates that the current training program is not successful at adequately transmitting the information.

While the planned actions have the potential to reduce some of the risk, they will benefit only pilots referring to the AIM or pilots targeted by the advisory circular. Without training on VGSI systems so pilots can determine if the system in use is appropriate for their aircraft, there continues to be a substantial level of risk to crews and the travelling public.

Requiring VGSI training as part of a pilot's aircraft type conversion training would provide an ideal opportunity to enhance awareness of any limitations that may exist between the aircraft and the various VGSI systems.

Given TC's proposals, the Board is concerned that the level of VGSI awareness among pilots and the associated risks identified in Recommendation A09-04 will not be fully addressed.

The response is assessed as **Satisfactory in Part**.

TSB staff will continue to monitor the state of VGSI training, and will follow up TC's response, its review of the AIM and issuance of an advisory circular.

Transport Canada’s response to Recommendation A09-04 (January 2011)

In its response, TC indicates that it has submitted updates to the AIM. These updates will advise air operators and pilots to contact the aircraft manufacturer to obtain EWH information.

TSB reassessment of Transport Canada’s response to Recommendation A09-04 (March 2011)

This reassessment is hindered by the lack of detailed information. In its response, TC indicates that it has submitted updates for the AIM. However, it appears that the scope of the updates have decreased since TC’s last response and will only direct operators and pilots to contact the aircraft manufacturers in order to obtain the aircraft EWH information.

In addition, while TC had indicated in its 05 February 2010 response that an advisory circular would be completed by spring of 2010, no information was provided to indicate the progress of the advisory circular.

The Board remains concerned that the current training program is not successful at adequately transmitting the information regarding VGSI. While the actions taken by TC may have some benefits, without the inclusion of VGSI awareness training, as part of a pilot’s training program, the level of VGSI awareness among pilots and the associated risks identified in Recommendation A09-04 will not be fully addressed.

TC’s proposed actions will not substantially reduce or eliminate the deficiency.

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

TSB staff will continue to monitor the state of VGSI training, the planned updates of the AIM and the possible issuance of an advisory circular.

Transport Canada’s response to Recommendation A09-04 (September 2011)

May 2011 input

We consider this recommendation closed as pilots are trained on visual slope indicator systems during their private and commercial courses. When a pilot takes training for their night rating, further training on visual slope indicator systems takes place. Transport Canada has reviewed the training and determined that additional training is not required.

Eye to Wheel Height issues are being addressed through Recommendation A09-03.

September 2011 update

See September 2011 update for Recommendation A09-02 for further information.

TSB assessment of Transport Canada’s response to Recommendation A09-04 (March 2012)

TC states that it has reviewed the training and determined that additional training is not required. In order to assess the response, the TSB needed more information as to how this determination was made. None was forthcoming.

In its response of February 2010, TC stated that it would produce an advisory circular by the spring of 2010. It did not. Last year the TSB sought an update on the publication of the advisory circular; no answer was received. And again this year, the TSB's questions regarding the circular have gone unanswered.

In addition, TC states that "Eye to Wheel Height issues are being addressed through Recommendation A09-03". The TSB agrees that Recommendations A09-03 and A09-04 go hand-in-hand, as pilots need to know the EWH of the aircraft they operate and the appropriateness of the VGSI signal they plan on using. However, they are to be treated separately: addressing one does not necessarily address the other. Recommendation A09-03 does not address the issue of training on VGSI systems so pilots can determine if the system in use is appropriate for their aircraft, as identified in Recommendation A09-04. Without those two elements, pilots may rely on VGSI guidance that is unsuitable for the aircraft type.

The Board remains concerned that the current training program is not effective at ensuring the information regarding VGSI is understood and applied. For example, a simple solution could be to verify a pilot's competency in the use of VGSI given EWH, during initial or recurrent pilot proficiency checks on type.

While the actions taken by TC may have some benefits, without the inclusion of VGSI awareness training, as part of a pilot's training and type certification program, the level of VGSI awareness among pilots and the associated risks identified in Recommendation A09-04 will not be fully addressed.

TC's proposed actions will reduce but not substantially reduce or eliminate the deficiency.

The response is considered **Satisfactory in Part**.

The TSB will continue to monitor TC's actions to reduce or eliminate this safety deficiency.

The deficiency file is assigned an **Active** status.

Transport Canada's response to Recommendation A09-04 (December 2012)

TC maintains its position that pilots are trained on visual slope indicator systems during their [private](#) and [commercial](#) courses.

During pilot training for night rating, further training on visual slope indicator systems takes place.

Additional information in the AIM-AGA section 7.6.1 - Approach Slope Indicator Systems Eye-Wheel-Height article was published October 2011 publication of AIM.

Transport Canada published an article in [ASL January 2012](#), to bring this change to the attention of readers. Transport Canada also published [AC No. 700-026](#) in August 2012.

TC has notified the operators regarding the hazard of using the guidance from an approach slope indicator system that is incompatible with an aircraft's eye wheel height (EWH) by sending them *Advisory Circular* (AC) No. 700-026. The advisory circular creates an expectation that the operators will assess the hazard and take action to mitigate the risk if appropriate. The methods to be used to transmit the information regarding VGSI are the operators' responsibility. No other action is contemplated at this time.

TSB assessment of Transport Canada's response to Recommendation A09-04 (March 2013)

Since 2007, TC has published several documents regarding VGSI. It still maintains its position that pilots be trained on visual glide slope indicator systems during their private, commercial and night flying training. However, TC did not provide information that would demonstrate that this training is given when pilots are upgrading to larger aircraft when this knowledge is most critical.

While the Board is pleased that VGSI information was distributed via different channels, it is concerned that TC has not taken steps to ensure that pilots can determine if the visual glide slope indicator (VGSI) systems they are using are appropriate for their aircraft, for example during pilot proficiency checks.

TC has indicated that no other action is contemplated at this time.

The response is considered **Satisfactory in Part**.

There is some residual risk but no further action is planned by the recommendation recipient and continued reassessments will not likely yield further results.

The deficiency file is assigned a **Dormant** status.

TSB review of Recommendation A09-04 deficiency file status (May 2017)

The Board requested that Recommendation A09-04 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 A09-04 still needed to be reassessed.

A request for further information was sent to Transport Canada and a reassessment will be conducted upon receipt of Transport Canada's response.

Therefore, the response to Recommendation A09-04 remains **Satisfactory in Part**.

Consequently, the status of Recommendation A09-04 is changed to **Active**.

Transport Canada's response to Recommendation A09-04 (October 2017)

TC agrees in principle with the recommendation.

TC maintains its position that pilots are trained on visual slope indicator systems during their private¹ and commercial courses.

The Study and Reference Guide, for written examinations for the PRIVATE PILOT LICENCE – AEROPLANE informs candidates

All subjects in this guide are considered to be important to applicants for the Private Pilot Licence–Aeroplane and may appear on the exam. Subject areas

¹ http://www.tc.gc.ca/eng/civilaviation/publications/tp12880-aeronautics-flight_operations-99.htm

identified by a bullet (†) are essential knowledge areas that will be emphasized on the written examination.

The Flight Operations section specifies the following knowledge requirements.

FLIGHT OPERATIONS

GENERAL

- 1 Pilot-In-Command responsibilities
- 2 Winter operations
- 3 Thunderstorms avoidance
- 4 Mountain flying operations
- 5 Collision avoidance – use of landing lights
- 6 Runway numbering
- 7 Airport rotating beacon
- 8 VASIS/PAPI
- 9 Obstruction marking and lighting
- 10 Units of measurements and conversion
- 11 Radio communications
- 12 Wheelbarrowing
- 13 Hydro-planning
- 14 Taxiing
- 15 Effects of wind and wind shear
- 16 Side-slips

The Study and Reference Guide, for written examinations for the Commercial Pilot Licence – Aeroplane² provides the following guidance to candidates.

Applicants for the Commercial Pilot Licence in the Aeroplane Category shall demonstrate their knowledge by writing a Transport Canada multiple choice examination on the subjects contained in this guide. Applicants must be able to read the examination questions in either English or French without assistance. All subjects in this guide are considered to be important to applicants for the Commercial Pilot Licence - Aeroplane. Some of the subjects appeared in the Private Pilot study guide. Additional subjects, and those where more depth of understanding is required at the commercial level, are shaded (this paragraph is an example). Subjects marked with a bullet (†) are considered essential knowledge for the commercial applicant.

During pilot training for night rating, further training on visual slope indicator systems takes place.

² <http://www.tc.gc.ca/eng/civilaviation/publications/tp12881-section7-1269.htm>

Additional information in the Aeronautical Information Manual (AIM)-AGA section 7.6.1 – Approach Slope Indicator Systems Eye Wheel Height (EWH) article was published October 2011 publication of AIM.

TC published an article in Aviation Safety Letter (ASL)³ January 2012, to bring this change to the reader's attention.

TC has notified the Operators regarding the hazard of using the guidance from approach slope indicator systems that is incompatible with an aircraft's EWH by sending them the AC-700-026 5. The AC creates an expectation that the Operators will assess the hazard and take action to mitigate the risk if appropriate. The methods to be used to transmit the information regarding Visual Glide Slope Indicator (VGSI) are the Operator's responsibility.

TC believes the risk associated with this recommendation has been addressed. No further action is contemplated at this time.

TSB reassessment of Transport Canada's response to Recommendation A09-04 (March 2018)

TC has taken a number of actions to address the safety deficiency identified in Recommendation A09-04, regarding training requirements on visual glide slope indicator (VGSI) systems, so pilots can determine if the system in use is appropriate for their aircraft. To date, these include the following:

- In 2010, TC revised Section 7.6, Approach Slope Indicator Systems, of the *Aeronautical Information Manual* (AIM), in order to provide more information on VGSI systems.
- In 2010, TC conducted a review of the training requirements for pilots, and determined that additional training on VGSI systems was not required, since this item is covered in various stages of a pilot's flight training towards a private pilot licence (PPL), a commercial pilot licence (CPL), and a night rating.
- In 2011, TC updated the AIM in order to advise operators and pilots that aircraft manufacturers should be contacted to obtain information on an aircraft's eye-to-wheel height (EWH). TC also raised awareness regarding this update through its January 2012 Aviation Safety Letter.
- In 2012, TC published additional information in Section 7.6.1, Approach Slope Indicator Systems Eye-Wheel-Height, of the AIM, regarding VGSI systems.
- In 2012, TC published an Advisory Circular (AC No. 700-026 - *Aircraft Eye Wheel Height Information*) to inform operators and pilots on updated information regarding VGSI systems and aircraft EWH. This AC also informed operators about the risks associated with the use of guidance from an approach slope indicator system that is incompatible with an aircraft's EWH, and encouraged operators to take the necessary actions to mitigate these risks.
- In 2017, TC provided the TSB with excerpts of the study and reference guides for PPL and CPL written examinations, which cover VGSI systems and principles. TC also reiterated that VGSI systems are covered in different stages of a pilot's flight training towards a PPL, a CPL, and a night rating.

³ <http://www.tc.gc.ca/eng/civilaviation/publications/tp18+H71-6205.htm>.

While the Board appreciates TC's actions, it also notes that TC's response to Recommendation A09-04 remains unchanged since December 2012. Without the inclusion of practical VGSi system training requirements as part of a pilot's initial and recurrent training, pilot proficiency checks, and type certification programs, the risks associated with the safety deficiency identified in Recommendation A09-04 continue to exist.

Therefore, the response to Recommendation A09-04 remains **Satisfactory in Part**.

Next TSB action

While there is some residual risk, no further action is planned by TC and continued reassessments will not likely yield further action by TC.

This deficiency file is **Closed**.