



Reassessment of the response to TSB Recommendation A19-01

Definition of “safety belt”

Background

On 14 December 2017, a Hydro One Networks Inc. Airbus Helicopters AS 350 B2 helicopter (registration C-GOHS, serial number 3240) equipped with an external platform, was transporting crews of power line technicians between a staging area and transmission towers in an area located 8 nautical miles north-northeast of Tweed, Ontario.

At 1144 Eastern Standard Time, the pilot picked up a crew of 3 power line technicians near the bottom of a tower for a return flight to the staging area. It had become common practice for power line technicians to attach tool bags and other small items to the external platform for flights to and from work sites. In line with this practice, the technicians attached a few items to the platform while boarding the helicopter, and then took their seats in the aft cabin.

The practice of carrying external loads attached to the platform was not a formalized procedure at the company and, as a result, adequate controls were not in place to ensure that these objects were properly stored or secured. Consequently, an empty canvas supply bag with an attached carabiner that was being carried on the platform was not adequately secured before the helicopter departed for the return flight to the staging area.

When the helicopter was 0.26 nautical miles from the staging area, the canvas bag separated from the platform and struck the helicopter's tail rotor, causing significant damage, severe imbalance, and intense vibration.

Shortly after, while the pilot was attempting to land, the helicopter's tail rotor, tail rotor gearbox, and vertical fin separated from the helicopter. The helicopter became uncontrollable and collided with terrain. The 3 power line technicians were unrestrained and became separated from the helicopter, either slightly before or during the impact, and received fatal injuries from contact with the helicopter or the surrounding terrain. The pilot was fatally injured on impact. The helicopter was destroyed.

The Board concluded its investigation and released report A1700264 on 30 October 2019.

TSB Recommendation A19-01 (October 2019)

All of the rear bench seats in the occurrence helicopter were equipped with 4-point detachable safety belts consisting of a lap strap and an automatic locking (inertia reel) shoulder harness. However, before the occurrence flight, the shoulder harness portions of these safety belts were rolled up and taped with electrical tape, which prevented them from being used.

Subsection 101.1(1) of the CARs defines a safety belt as “a personal restraint system consisting of **either** [emphasis added] a lap strap or a lap strap combined with a shoulder harness.” Based on this definition, Hydro One Networks Inc. considered that it would be in compliance with the regulations that required the use of safety belts if occupants wore either the lap strap alone, or the lap strap combined with the shoulder harness.

From 1990 to 2018, the TSB has investigated many accidents involving aircraft that were equipped with detachable shoulder harnesses where it was determined that the harnesses were not being worn at the time of the accident (Appendix B). Of the 62 accidents identified, 33 were fatal, resulting in 68 deaths. Of those 68 deaths, 37 were individuals who had not been wearing the available shoulder harness. Although the survivability of these 62 accidents varied, the use of shoulder harnesses in many cases could have improved the odds of survival and egress.

Passengers who are not adequately restrained during a survivable accident, particularly when the main passenger compartment remains relatively intact, are at greater risk of receiving serious or fatal injuries than passengers who are adequately restrained. While the interpretation of the regulations was not the only reason for not wearing the shoulder harness in the cases examined, in this case, the ambiguity did affect their use.

TC attempted to clarify the regulations in Aviation Safety Letters 4/2013 and 1/2018, and Advisory Circular 605-004 (November 2014). However, if regulations are not clear in requiring the use of all available components of a safety belt, shoulder harnesses may not be used as intended, increasing the risk of injury or death.

Therefore, the Board recommended that

the Department of Transport amend the *Canadian Aviation Regulations* to remove any ambiguity associated with the definition of “safety belt”

TSB Recommendation A19-01

Transport Canada’s response to Recommendation A19-01 (January 2020)

Transport Canada (TC) agrees with aviation safety recommendation (A19-01).

In December of 2019 TC began to conduct a preliminary assessment of the regulatory impact of changing the definition of “safety belt”. The assessment is expected to be completed in early spring 2020.

The assessment includes: a review of the definition in the *Canadian Aviation Regulations* (CARs) and an analysis of the potential consequences of this definition change to other parts of the regulations. Once consultation with stakeholders is conducted and the most appropriate mechanism for undertaking this recommended change is determined, the regulatory work to amend the definition will commence.

TC will be able to provide a more detailed timeline for this change upon completion of the preliminary analysis. If the change to the definition is deemed to have minimal impact, then the change may be pursued using the Miscellaneous Amendments Regulations (MAR) process. However, if potential consequences to other parts of the CARs are identified, the change will need to follow the full federal regulatory development process.

In the meantime, as described in the investigation report, TC has already taken mitigating measures to encourage the proper use of safety belts. TC began informally consulting with stakeholders on the potential impact of the recommended change in the margins of the Helicopter Association of Canada (HAC) annual meeting in November 2019. In addition, TC has published guidance material concerning the use of safety belts in Aviation Safety Letters (ASL) 4/2013¹ and 1/2018², and Advisory Circular (AC) 605-004³. Also, more recently, TC has published Civil Aviation Safety Alert (CASA) 2018-02⁴ reminding operators of the correct use of passenger seatbelts and the importance of securing cargo.

TSB assessment of Transport Canada's response to Recommendation A19-01 (March 2020)

In its response, Transport Canada (TC) indicated that it agrees with Recommendation A19-01 and that it has begun assessing the regulatory impact of changing the definition of "safety belt" in subsection 101.1(1) of the *Canadian Aviation Regulations* (CARs). This assessment includes the possible effects the modification would have on other parts of the regulations.

This assessment will determine the process TC will have to follow. Once the impact of the definition change has been determined, TC will be in a better position to advise of the timeline necessary to implement the changes.

Following the receipt of TSB's safety advisory letter, TC took the following actions:

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- ¹ Transport Canada (2013), Aviation Safety Letter 4/2013 - *Shoulder Harnesses and Seat Belts — Double Click for Safety*. Available at: https://www.tc.gc.ca/en/services/aviation/documents/ASL_4_2013E_Dec11amV2.pdf
 - ² Transport Canada (2018), Aviation Safety Letter 1/2018 - *Shoulder Harnesses and Seat Belts — Double Click for Safety*. Available at: <https://www.tc.gc.ca/en/services/aviation/documents/Aviation-Safety-Letter-1-2018-eng.pdf>
 - ³ Transport Canada (2014), Advisory Circular 604-004 - *Use of Safety Belts and Shoulder Harnesses On Board Aircraft*. Available at: https://www.tc.gc.ca/en/services/aviation/documents/AC_605_004_ISSUE_02_USE_OF_SAFETY.pdf
 - ⁴ Transport Canada (2018), Civil Aviation Safety Alert 2018-02 - *Use of Seatbelts and Cargo Security*. Available at: <https://www.tc.gc.ca/en/services/aviation/reference-centre/safety-alerts/use-seatbelts-cargo-security.html>

- In early 2018, published guidance material concerning the use of safety belts in Aviation Safety Letter (ASL) issue 1/2018.
- In March 2018, published Civil Aviation Safety Alert (CASA) 2018-02, reminding operators of the correct use of passenger seatbelts and the importance of securing cargo.

Additionally, in November 2019, TC informally consulted with stakeholders at the Helicopter Association of Canada annual meeting on the potential impact of a definition change.

The Board is encouraged that TC has initiated work to address this safety deficiency. A change in the definition of “safety belt,” when fully implemented, will mitigate the risk associated with the safety deficiency identified in Recommendation A19-01.

Therefore, the Board considers the response to Recommendation A19-01 to show **Satisfactory Intent**.

Transport Canada’s response to Recommendation A19-01 (December 2020)

TC agrees with the recommendation.

In TC’s initial response of January 2020 (RDIMS 16128968), the Department committed to conduct a preliminary assessment of the regulatory impact of changing the definition of “safety belt” by early spring 2020.

Following this preliminary assessment, TC concluded that a change to the definition of “seat belt” in section 101 of the CARs was not the most effective solution. Definitions themselves are not rules of conduct and have no enforceability, therefore, TC has decided not to go with this option. The rules of conduct found in various parts of the CARs however, are enforceable, and after further analysis TC concluded that clarifying the language used in sections 605.25, 605.26 and 605.27 of the CARs would have no adverse impact. TC will pursue amendments to specify that a safety belt is properly fastened when all components are in use. This will eliminate misconceptions that partial use of a restraint system is within compliance.

In addition to regulatory amendment, TC proposed to initiate a safety awareness campaign to remind operators of the importance for persons carried onboard an aircraft to use all components of restraint systems available to them in their operations.

TC is in consultation with legal services to confirm the necessary changes to the CARs to address the Transportation Safety Board (TSB) recommendation. Drafting and consultation with respect to the Notice of Proposed Amendment (NPA) (both internally and through the Canadian Aviation Regulation Advisory Council (CARAC) will run until winter 2021.

The intended approach at the moment is to publish directly GC-II as part of a Miscellaneous Amendments Regulations (MAR), unless otherwise advised by the TC legal counsel.

In the meantime, TC has published guidance material concerning the use of safety belts in Aviation Safety Letters (ASL) 4/2013⁵ and 1/2018⁶, and Advisory Circular (AC) 605-004⁷. Also, more recently, TC has published Civil Aviation Safety Alert (CASA) 2018-02⁸ reminding operators of the correct use of passenger seatbelts and the importance of securing cargo.

TSB reassessment of Transport Canada’s response to Recommendation A19-01 (March 2021)

In its response, Transport Canada (TC) indicated that it agrees with Recommendation A19-01.

Following a preliminary assessment of the regulatory impact of changing the definition of “safety belt” in subsection 101.01(1) of the *Canadian Aviation Regulations* (CARs), TC concluded that this not the most effective solution because definitions have no enforceability.

Instead, in order to eliminate misconceptions that partial use of a restraint system is within compliance, TC has decided to pursue amendments to sections 605.25, 605.26, and 605.27 of the CARs to specify that a safety belt is properly fastened when all components are in use.

In addition, TC plans to initiate a safety awareness campaign to remind operators of the importance of ensuring that all persons on board an aircraft use all components of the restraint systems available to them in their operations.

The Board is encouraged by the work initiated by TC and its proposal to address this safety deficiency. When fully implemented, the proposed amendments to the regulations to eliminate misconceptions that partial use of a restraint system is compliant will mitigate the risks associated with the safety deficiency identified in Recommendation A19-01.

Therefore, the response to Recommendation A19-01 is assessed as **Satisfactory Intent**.

Transport Canada’s response to Recommendation A19-01 (December 2021)

Transport Canada (TC) agrees with the recommendation.

Since the recommendation was issued in December 2019, TC committed to conduct a preliminary assessment of the regulatory impact of changing the definition of “safety belt”. In

⁵ Transport Canada (2013). *Aviation Safety Letter 4/2013 – Shoulder harnesses and Seat Belts—Double Click for Safety*. Available at: https://tc.canada.ca/sites/default/files/migrated/asl_4_2013e_dec11amv2.pdf

⁶ Transport Canada (2018). *Aviation Safety Letter 1/2018 – Shoulder Harnesses and Seat Belts—Double for Safety*. Available at: https://tc.canada.ca/sites/default/files/migrated/aviation_safety_letter_1_2018_eng.pdf

⁷ Transport Canada (2014). *Advisory Circular 605-004 - Use of Safety Belts and Shoulder Harnesses On Board Aircraft*. Available at: <https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-605-004>

⁸ Transport Canada (2018). *Civil Aviation Safety Alert 2018-02 - Use of Seatbelts and Cargo Security*. Available at: <https://tc.canada.ca/en/aviation/reference-centre/civil-aviation-safety-alerts/use-seatbelts-cargo-security-civil-aviation-safety-alerts-casa-no-2018-02>

our last update in December 2020, the Department concluded that a change to the definition of “seat belt” in section 101 of the *Canadian Aviation Regulations* (CARs) was not the most effective solution since definitions themselves are not rules of conduct and have no enforceability.

TC has then decided to pursue amendments to clarify the language used in sections 605.25, 605.26 and 605.27 of the CARs and specify that a safety belt is properly fastened when all components are in use. These rules of conduct are enforceable, and after further analysis, TC concluded that this amendment would have no adverse impact and will eliminate misconceptions that partial use of a restraint system is within compliance.

On March 1st, 2021, the Proper Use of Safety Belts Notice of Proposed Amendment (NPA 2021-003)⁹ was sent to CARAC Members and published in *Canada Gazette*, Part II,¹⁰ on July 7th, 2021. The amendment removes any perceived ambiguity associated with the definition of “safety belt,” thereby ensuring clarity and certainty of proper safety belt use as recommended by the TSB.

TC also committed in its previous update to initiate a safety awareness campaign to remind operators of the importance for persons carried onboard an aircraft to use all components of restraint systems available to them in their operations. TC is finalizing the update of Advisory Circular (AC) 605-004 - *Use of Safety Belts and Shoulder Harnesses on Board Aircraft*¹¹. This updated publication has been approved and is in the process for publication.

Finally, TC has also published guidance material in the past concerning the use of safety belts in Aviation Safety Letters (ASL) 4/2013¹² and 1/2018.¹³ TC has also published Civil Aviation Safety Alert (CASA) 2018-02¹⁴ reminding operators of the correct use of passenger seatbelt and the importance of securing cargo.

⁹ Transport Canada (2021). *Notice of Proposed Amendments (NPA) 2021-003 – Proper Use of Safety Belts*. Available via the CARAC website at: <https://tc.canada.ca/en/corporate-services/acts-regulations/list-regulations/canadian-aviation-regulations-sor-96-433/canadian-aviation-regulation-advisory-council-carac>

¹⁰ Government of Canada (2021). *Canada Gazette*, Part II, Volume 155, Number 14 – *Regulations Amending the Canadian Aviation Regulations (Safety Belts)*: SOR/2021-153. Available at : <https://canadagazette.gc.ca/rp-pr/p2/2021/2021-07-07/html/sor-dors153-eng.html>

¹¹ Transport Canada (2014). *Advisory Circular (AC) 605-004 – Use of Safety belts and Shoulder Harnesses on Board Aircraft*. [Issue 3 in the process of being published]. Available at: <https://tc.canada.ca/en/aviation/reference-centre/advisory-circulars/advisory-circular-ac-no-605-004>

¹² Transport Canada (2013). *Aviation Safety Letter Issue 4/2013 (TP 185E). Shoulder Harnesses and Seat Belts – Double Click for Safety*. Available at: https://tc.canada.ca/sites/default/files/migrated/asl_4_2013e_dec11amv2.pdf

¹³ Transport Canada (2018). *Aviation Safety Letter Issue 1/2018 (TP 185E). Shoulder Harnesses and Seat Belts – Double Click for Safety*. Available at: https://tc.canada.ca/sites/default/files/migrated/aviation_safety_letter_1_2018_eng.pdf

¹⁴ Transport Canada (2018). *Civil Aviation Safety Alerts (CASA) 2018-02 – Use of Seatbelts and Cargo Security*. Available at: <https://tc.canada.ca/en/aviation/reference-centre/civil-aviation-safety-alerts/use-seatbelts-cargo-security-civil-aviation-safety-alerts-casa-no-2018-02>

TSB reassessment of Transport Canada's response to Recommendation A19-01 (March 2022)

In its response, Transport Canada (TC) indicated that it agrees with Recommendation A19-01.

Following a preliminary assessment of the regulatory impact of changing the definition of "safety belt" in subsection 101.01(1) of the *Canadian Aviation Regulations* (CARs), TC concluded that this was not the most effective solution because definitions are not rules and cannot be enforced.

Instead, to eliminate the misconception that partial use of a restraint system complies with the regulations, TC decided to pursue amendments to sections 605.25, 605.26, and 605.27 of the CARs to specify that a safety belt is properly fastened when all components are in use.

TC stated that on 01 March 2021, the Proper Use of Safety Belts Notice of Proposed Amendment (NPA 2021-003) was sent to members of the Canadian Aviation Regulation Advisory Council (CARAC).

The NPA was published in the *Canada Gazette*, Part II, on 07 July 2021,¹⁵ which amended sections 605.25, 605.26, and 605.27 of the CARs. The amendments include new wording to remove any ambiguity pertaining to the use of safety belts, and clarifies that safety belts, including shoulder harnesses, must be fastened.

The Board believes that these amendments have substantially reduced the risk associated with the safety deficiency identified in Recommendation A19-01.

Therefore, the response to Recommendation A19-01 is assessed as **Fully Satisfactory**.

Next TSB action

This deficiency file is **Closed**.

¹⁵ Government of Canada, *Canada Gazette, Part II, Volume 155, Number 14 – Regulations Amending the Canadian Aviation Regulations (Safety Belts): SOR/2021-153 (2021)*, at <https://canadagazette.gc.ca/rp-pr/p2/2021/2021-07-07/html/sor-dors153-eng.html>.