



REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A15-02

Required use of child restraint systems

Background

On 22 December 2012, the Perimeter Aviation LP, Fairchild SA227-AC Metro III (registration C-GFWX, serial number AC650B), operating as Perimeter flight PAG993, departed Winnipeg/James Armstrong Richardson International Airport, Manitoba, at 1939 Coordinated Universal Time (1339 Central Standard Time) as a charter flight to Sanikiluaq, Nunavut. Following an attempted visual approach to Runway 09, a non-precision non-directional beacon (NDB) Runway 27 approach was conducted. Visual contact with the runway environment was made and a circling for Runway 09 initiated. Visual contact with the Runway 09 environment was lost and a return to the Sanikiluaq NDB was executed. A second NDB Runway 27 approach was conducted with the intent to land on Runway 27. Visual contact with the runway environment was made after passing the missed approach point. Following a steep descent, a rejected landing was initiated at 20 to 50 feet above the runway; the aircraft struck the ground approximately 525 feet beyond the departure end of Runway 27. The 406 MHz emergency locator transmitter activated on impact. The 2 flight crew and 1 passenger sustained serious injuries, 5 passengers sustained minor injuries, and 1 infant was fatally injured. Occupants exited the aircraft via the forward right overwing exit and were immediately transported to the local health centre. The aircraft was destroyed. The occurrence took place during the hours of darkness at 2306 Coordinated Universal Time (1806 Eastern Standard Time).

The Board concluded its investigation and released Aviation Investigation Report A12Q0216 on 29 June 2015.

TSB Recommendation A15-02 (June 2015)

Although there is a lack of data readily available on the number of infants and child passengers travelling, data retrieved from a sample of 4 Canadian operators in the course of this investigation show that children and infants make up a significant portion (nearly 14%) of their total passengers. These numbers reflect only a portion of the number of infants and children travelling by air. There are currently 583 registered commercial fixed-wing operators in Canada. Transport Canada (TC) statistics show that passenger traffic at Canadian airports increased 2.9% in 2013, to reach 85.2 million enplaned and deplaned passengers.

Biomechanical research has found that, due to limitations in human clasping strength, it is not always possible for adults to restrain children adequately in their laps by holding onto them. Infants are therefore exposed to undue risk of injury when seated on an adult's lap. In most countries around the world, including Canada, infants are not required to be restrained in an age- and size-appropriate child restraint system (CRS) at any time during a flight. Research has also shown that, given the specific physical features of young children, the standard adult seatbelt does not provide a suitable method of restraint.

Most jurisdictions recommend that infants and young children travel restrained in an approved CRS during a flight; however, its use is not mandatory. Although research has been conducted over the last 25 years, and participation in the development of CRS standards and training standards has taken place and is ongoing, there has been no progress on the required use of appropriate CRS on commercial aircraft.

Although passengers are required to securely stow all carry-on baggage during takeoff and landing because of the potential risk of injury to other passengers should an unexpected hazardous event occur, passengers continue to be permitted to hold in their lap a child of a size and weight equal to carry-on baggage. If children under 2 years old are not required to be restrained for their own safety, the safety of other passengers also becomes an issue.¹

The National Transportation Safety Board of the United States has identified several occurrences where crew, adult passengers, and children have sustained injury during unexpected moderate-to-severe turbulence, and described how lap-held infants and children would likely have survived the occurrences or suffered less severe injury had they been properly restrained.² A number of aircraft accidents, including the occurrence under investigation, have demonstrated the risk to infants and young children who are not properly restrained. Given the overall safety performance of commercial aviation, passengers may underestimate the risks associated with unexpected in-flight turbulence and emergency situations.

TC has no further plans to educate the travelling public or promote the use of CRS at this time. The Board is concerned that until such time as the use of age- and size-appropriate CRS is required, parents and guardians will continue to travel with infants and children without the safety benefits provided by CRS.

Infants and children who are not properly restrained are at risk of injury and possibly death, and may cause injury or death to other passengers. Until new regulations on the use of CRS are implemented, lap-held infants and young children are exposed to undue risk and are not provided with an equivalent level of safety compared to adult passengers.

Therefore, the Board recommends that:

¹ United Airlines Flight 232-Sioux City, IA 1989; US Air Flight 1016-Charlotte, NC 1994; Continental Flight 267-Severe turbulence 1995; American Airlines Flight 903-Inflight upset 1997; Southwest Airlines Flight 2809-Severe turbulence 2008; General Aviation occurrence, Butte, MT 2009.

² V. Gowdy and R. DeWeese, The performance of child restraint devices in transport airplane passenger seats, Federal Aviation Administration (FAA) Office of Aviation Medicine, Report No. DOT/FAA/AM-94/19. September 1994.

The Department of Transport work with industry to develop age- and size-appropriate child restraint systems for infants and young children travelling on commercial aircraft, and mandate their use to provide an equivalent level of safety compared to adults.

TSB Recommendation A15-02

Transport Canada's response to Recommendation A15-02 (September 2015)

The Department of Transport will take action to reduce the risk to which infants and young children are exposed when travelling by air, whether it is on flights in Canada's remote north, from city to city domestically, or on international carriers flying into Canada.

In the short term, the department will explore ways to increase the range of child restraint systems (CRS) that parents can use on Canadian air carriers. The intent is to allow not only the currently approved CRS but also those approved by foreign authorities to be accepted for use on Canadian aircraft.

In the medium term, the department is planning an awareness campaign focused on the risks to which children are exposed to while travelling on commercial aircraft. The campaign will be launched in the fall 2015 and will be aimed at the industry, to ensure ground agents and crew members are well informed on permissible mitigation measures, as well as the travelling public.

During fiscal year 2016–17, the department will initiate an in-depth regulatory examination of the issue. The department would issue a notice that would articulate its intent to determine the most effective means of addressing the recommendation and would then outline its plan and consult industry stakeholders.

Transport Canada will continue to participate in and support international efforts to improve passenger safety, particularly through the International Civil Aviation Organization (ICAO) passenger Safety Working Group and follow-on activities with a view to harmonization with international partners.

TSB assessment of Transport Canada's response to Recommendation A15-02 (November 2015)

In its response, Transport Canada indicated that it will take a threefold approach to address this recommendation and reduce the risk to which infants and young children are exposed when travelling by air.

In the short term, Transport Canada will explore ways to increase the range of child restraint systems accepted for use on Canadian aircraft. In the medium term, it is planning an awareness campaign in late 2015, for industry, on the risks to which children are exposed while travelling on commercial aircraft. In the longer term, during fiscal year 2016/2017, it will initiate an in-depth regulatory examination of the issue and outline its plan to consult industry stakeholders.

The Board is encouraged to note that Transport Canada is planning to take some short and medium term actions, while initiating an in-depth review to address the safety deficiency. However, the Board also notes that the International Civil Aviation Organization (ICAO) has recently published guidance to regulators on implementing regulations for child restraint systems. The availability of this material may be useful in accelerating the regulatory examination. Although Transport Canada's proposed actions may have some benefits, its

response does not yet identify specific solutions that will ensure infants and young children are provided a level of safety comparable to adults.

Therefore, the response to Recommendation A15-02 is assessed as Satisfactory Intent.

Transport Canada's response to Recommendation A15-02 (January 2016)

Short term: Exemption NCR 2015-078 – Exemption from Subsection 605.26(1) of the *Canadian Aviation Regulations* (CARs) was completed last November. The purpose of the exemption is to "...exempt all passengers using a Child Restraint System foreign-approved to design standards not included in paragraph 551.501(b)(1) of the AWM, all passengers responsible for an infant and all passengers responsible for a person using a Child Restraint System foreign-approved to design standards not included in paragraph 551.501(b)(1) of the AWM from the requirements under subsection CAR 605.26(1)."

Medium term: Transport Canada (TC) is committed to launch a public awareness campaign on CRS in the summer/fall 2016 timeframe. TC is currently at the design stage of this project.

TSB reassessment of Transport Canada's response to Recommendation A15-02 (April 2016)

In its response, Transport Canada indicated that it will take a threefold approach to address this recommendation and reduce the risk to which infants and young children are exposed when travelling by air.

In the short term, Transport Canada issued an exemption to increase the range of child restraint systems accepted for use on Canadian aircraft. In the medium term, Transport Canada is planning a public awareness campaign in the summer/fall 2016 timeframe on the risks to which children are exposed while travelling on commercial aircraft. In the longer term, during fiscal year 2016–17, Transport Canada will initiate an in-depth regulatory examination of the issue and outline its plan to consult industry stakeholders.

The Board is encouraged to note that Transport Canada has started taking action, while initiating an in-depth review to address the safety deficiency. However, the Board also notes that ICAO has published guidance to regulators on implementing regulations for child restraint systems. The availability of this material may be useful in accelerating the regulatory examination.

Although Transport Canada's proposed actions in the medium and long term may have some benefits, the TSB cannot evaluate if these actions will provide specific solutions that will ensure infants and young children are provided an equivalent level of safety compared to adults.

Therefore, the response to Recommendation A15-02 is assessed as **Satisfactory Intent**.

Transport Canada's response to Recommendation A15-02 (February 2017)

In 2016-17, work was initiated on an in-depth regulatory examination of the issue. TC has progressed on gathering data and analyses done by other civil aviation authorities to help inform our direction. The department plans to complete the in-depth regulatory examination this fall. The department would then issue a notice that would articulate its intent to determine

the most effective means of addressing the recommendation and would then outline its plan and consult industry stakeholders.

Since launching the awareness campaign, including a number of advisory circulars and some social media activities, TC is planning a second phase to its awareness activities, which it plans on implementing this summer.

TSB reassessment of Transport Canada's response to Recommendation A15-02 (March 2017)

TC's latest response indicates that it has started an in-depth regulatory examination of this issue, which includes collecting data and analyses done by other civil aviation authorities. This examination will conclude in the fall. In addition, TC is planning a second phase to its awareness activities, starting this summer. Subsequently, TC advised it will also participate in the upcoming ICAO Cabin Safety Group meeting to work on the development of revised international guidance on child restraint systems.

The Board is encouraged that TC is taking various actions. However, at this time, the Board is unable to determine if these actions will result in specific solutions to address the safety deficiency identified in Recommendation A15-02.

Therefore, the response to Recommendation A15-02 is assessed as **Satisfactory Intent**.

Next TSB action

The TSB will continue to monitor the progress of TC's planned actions to mitigate the risks associated with the safety deficiency identified in Recommendation A15-02, and will reassess the deficiency on an annual basis or when otherwise warranted.

This deficiency file is **Active**.