REASSESSMENT OF THE RESPONSE TO TSB RECOMMENDATION A91-09

Installation of optional push-out windows

Background

On 17 April 1990, near Blue River, British Columbia, a "heli-ski" Bell 212 helicopter rolled over and burned shortly after lift-off. The impact forces experienced by the occupants during the landing and the roll-over were survivable; moreover, the results of the investigation suggest that none of the occupants was incapacitated by impact forces. Eleven of the occupants were able to successfully exit the helicopter; however, three people were unable to exit and succumbed to the effects of the post-crash fire.

After striking the ground, the helicopter rolled onto its left side, prohibiting the use of the left-side exits. The passengers released their seat-belts and fell to the left side of the cabin. The Bell 212 passenger compartment is eight feet wide, which made passenger access to the right-side emergency exit (now some distance overhead) very difficult.

Fortunately, eight of the 11 people who successfully egressed were able to do so through the flight crew compartment and did not have to rely upon the right-side exit. The investigation of this accident identified a number of safety deficiencies, most of which relate to problems encountered by passengers while evacuating "wide- body" helicopters in an emergency.

The Board concluded its investigation and released Aviation Investigation Report A90P0121 on 04 May 1993.

TSB Recommendation A91-09 (April 1991)

In light of the current popularity of heli-skiing, and in consideration of the large number of passengers carried on most heli-ski and heli-hiking flights, the Board believes that special precautions must be taken in these operations to ensure that all of the occupants have ample opportunity to evacuate the aircraft in the event of an emergency.

Therefore the Board recommends that:

> The Department of Transport immediately require Canadian operators of Bell models 205Al and 212 helicopters engaged in "heli-skiing" or "heli-hiking" operations to install Bell's optional push-out window emergency exits.
>
> **TSB Recommendation A91-09**

Transport Canada's response to Recommendation A91-09 (July 1991)

Transport Canada strongly supports the concern of this recommendation. The actions planned in response to recommendations A91-06, A91-07, A91- 08, and A91-10 will make the emergency

exit hatches as effective as the push- out windows for emergency egress. Accordingly, Transport Canada (TC) does not propose to mandate the push-out windows, but will investigate means to improve egress for the persons sitting in the side-facing seats alongside the transmission, who are most disadvantaged for egress when the helicopter is resting on its side.

TSB assessment of the response to Recommendation A91-09 (August 1991)

While TC strongly supported the concern expressed in this recommendation, they will not mandate the push-out windows. TC believes that their actions, to satisfy recommendations A91-06 (immediate one-time examination of the emergency exit cover panels- action satisfactory); A91-07 (periodic functional check of the emergency exit cover panels - response unsatisfactory); A91-08 (emergency exit handle access system redesign – response satisfactory for now); and A91-10 (emergency exit activation instructions - response satisfactory); will make the emergency exit hatches as effective as the push-out windows for emergency egress. Accordingly, TC will investigate means by which egress for persons sitting in the side-facing seats alongside the transmission can be improved, because these people are at the greatest disadvantage when the helicopter is resting on its side.

In effect TC believes that the deficiency which Recommendation A91-09 sought to address will be resolved by other actions; they would prefer to focus on a perceived safety deficiency which the TSB did not identify.

The TC initiative is commendable but the decision not to pursue the action proposed in Recommendation A91-09 is based on a number of assumptions, the validity of which cannot be verified at this time.

Staff believe that notwithstanding the modifications to the emergency exit activation instructions, or to the emergency exit handle cover panel, which may be incorporated as a result of recommendations A91-08 and A91-10, the mandatory installation of the push-out windows would be the most effective solution to the problem of evacuating large passenger loads in an emergency. The push-out windows offer the simplest of instructions by directing the distressed passenger to do what is most natural and what is most easily accomplished under exigent circumstances.

TC's concern focuses on the fact that two of the three people that perished in the Blue River accident were seated in the left side "love seats". The third person was seated directly in front of them in the extreme left seat of the forward-facing row of bench seats. Unquestionably these passengers, because they were on the low side of the helicopter when it rolled-over, and because of the restricted access to the cabin from the love seats encountered difficulties extricating themselves from that location. However, the investigation has not established why the passengers in the left-side love seats were not able to exit the helicopter. It is most likely they failed to exit the helicopter due to the delay that the other passengers experienced locating and accessing an appropriate exit. The TSB recommendations aimed at improving egress for passengers in the main passenger cabin, thereby providing passengers seated in the love seat behind them more expeditious access to the cabin emergency exits. For this reason, the TSB did not directly address the issue of egress for occupants of the "love seats", as TC now proposes.

TSB staff support all efforts by TC to improve access by the "love seat" passengers to the emergency exits. However, staff believe that the proposal set out in Recommendation A91-09 to require "push-out" windows on helicopters carrying large passenger loads is the best means to accelerate the evacuation.

Accordingly, staff believe that the response does not address the safety deficiency, and is **Unsatisfactory**.

TSB reassessment of the response to Recommendation A91-09 (November 1996)

Retrofits at reasonable cost are now available under supplemental type approval.

Therefore, the response to Recommendation A91-09 is assessed as **Satisfactory in Part**.

TSB reassessment of the response to Recommendation A91-09 (November 1997)

While TC will not mandate the use of push-out windows in "heli-skiing" or "heli-hiking" operations, retrofits are now available at reasonable cost under supplemental type approval. Anecdotal information indicates voluntary retrofits are common.

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

As such, "Further Action is Unwarranted" with respect to Recommendation A91-09 and the status is set to **Inactive**.

TSB review of Recommendation A91-09 deficiency file status (April 2014)

The Board requested that Recommendation A91-09 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 A91-09 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 assessment remains **Satisfactory in Part**.

Consequently, the status of Recommendation A91-09 is changed to **Active.**

Transport Canada's response to Recommendation A91-09 (July 2015)

TCCA agrees with the spirit of this recommendation (facilitating emergency egress), and believes measures implemented to date have mitigated the risk. For example: TC's promotion of push out windows and industry initiatives including improved emergency door markings and means to access the doors when the aircraft has turned on its side. TCCA will continue to monitor, but for now believes no further action is required and that the item can be closed.

TSB reassessment of the response to Recommendation A91-09 (March 2016)

The Board recognizes the measures implemented to date by Transport Canada; however, the mandatory installation of the push-out windows remains the most effective solution to the problem of evacuating large passenger loads in an emergency.

Therefore, the Board believes the decision by Transport Canada not to mandate the use of push-out windows in "heli-skiing" or "heli-hiking" operations does not address the safety deficiency.

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

Transport Canada's response to Recommendation A91-09 (January 2017)

TCCA agrees with the spirit of this recommendation (facilitating emergency egress), and believes measures implemented to date have mitigated the risk, such as TC's promotion of push out windows and industry initiatives, including improved emergency door markings and means to access the doors when the aircraft has turned on its side.

As indicated in the summer 2015 update, TC has no further activities planned on this recommendation.

TSB reassessment of Transport Canada's response to Recommendation A91-09 (May 2017)

TSB staff carried out an informal survey of heli-skiing and heli-hiking operators in western Canada. Operators currently using Bell helicopter models 205A1 and 212 responded that they have installed Bell's optional push-out window emergency exits.

While TC did not mandate the retrofit of push-out window emergency exits for heli-skiing and heli-hiking operations, operators currently using these types of helicopters have mitigated the identified risk by voluntarily complying with the Board's recommendation. Hence, the residual risk associated with this recommendation is assessed as low.

The Board has assessed TC's response to Recommendation A91-09 as **Satisfactory in Part.** However, the actions taken by operators have substantially reduced the risk identified in Recommendation A91-09.

Next TSB action

This deficiency file is **Closed**.