



## REASSESSMENT OF THE RESPONSE TO AVIATION SAFETY RECOMMENDATION A11-04

### Emergency underwater breathing apparatus

#### Background

On 12 March 2009, at 0917 Newfoundland and Labrador Daylight Time, a Cougar Helicopters' Sikorsky S-92A (registration C-GZCH, serial number 920048), operated as Cougar 91 (CH191), departed St. John's International Airport, Newfoundland and Labrador, with 16 passengers and 2 flight crew, to the Hibernia oil production platform. At approximately 0945, 13 minutes after levelling off at a flight-planned altitude of 9000 feet above sea level (asl), a main gearbox (MGB) oil pressure warning light illuminated. The helicopter was about 54 nautical miles (nm) from the St. John's International Airport. The flight crew declared an emergency, began a descent to 800 feet asl, and diverted back towards St. John's. At 0955, approximately 35 nm from St. John's, the crew reported that they were ditching. Less than 1 minute later, the helicopter struck the water in a slight right-bank, nose-high attitude, with low speed and a high rate of descent. The fuselage was severely compromised and sank quickly in 169 metres of water. One passenger survived with serious injuries and was rescued approximately 1 hour and 20 minutes after the accident. The other 17 occupants of the helicopter died of drowning.

The Board concluded its investigation and released report A09A0016 on 09 February 2011.

#### Board Recommendation A11-04 (February 2011)

Drowning is the leading cause of death following a helicopter ditching or water impact and was the cause of all 17 fatalities on CHI91. It is likely that several of the occupants remained conscious after water impact, eventually breaking their breath-holds due to cold water shock and drowning before they could egress the sinking helicopter. The occupants who remained seated had no means of extending the breathing time available in which to release their seatbelts and escape.

Research has determined that 29 to 92 seconds are normally required for an occupant to escape from a submerged helicopter. One study has shown that the median breath-holding time of 228 offshore oil workers immersed in warm 25°C water was 37 seconds. By comparison, the water temperatures of the North Atlantic off Newfoundland average between 1°C and 2°C during the winter months and between 12°C and 14°C in the summer. As water temperature decreases, so does the average breath-hold time. Breath-hold decreases rapidly once the water temperature drops below 15°C. In near freezing water, breath-hold drops as low as 5 to 10 seconds. At the time of the occurrence, the water temperature was approximately 0°C – making escape almost impossible, even for a fit person well trained in escaping from a submerged helicopter.

Each year, several thousand individuals are transported multiple times by helicopter over cold water to and from offshore facilities in Canada. Without a supplemental breathing system,

occupants have very little time to egress from a submerged or capsized helicopter before breaking their breath-holds. In Newfoundland, these offshore workers are now being provided with an emergency underwater breathing apparatus (EUBA) system. Because the issue was left to offshore oil regulators, however, there is no uniformity in the practice. This means there will continue to be overwater helicopter operations in other regions of Canada that may not provide this system to their passengers.

Helicopter passengers are required by regulation to wear a passenger transportation suit system (PTSS) whenever their flight is an extended one over cold water. Currently, however, there is no comparable requirement for an EUBA for use in an emergency. As a result, occupants are exposed to increased risk of drowning following a ditching or a crash at sea.

Therefore, the Board recommends that:

Transport Canada require that supplemental underwater breathing apparatus be mandatory for all occupants of helicopters involved in overwater flights who are required to wear a PTSS.

**TSB Recommendation A11-04**

### **Transport Canada's response to Recommendation A11-04 (June 2011)**

"Transport Canada (TC) is initiating a focus group during the summer of 2011 with industry stakeholders to review the recommendations related to when the sea state will not permit safe ditching, and successful evacuation as well as mandatory supplemental breathing apparatus be made mandatory for all occupants of helicopters involved in overwater flights who are required to wear a Passenger Transportation Suit System (PTSS).

On the basis of these discussions, Transport Canada will develop an advisory bulletin for publication in the fall of 2011. Transport Canada will also present the results from the focus group to the Canadian Aviation Regulation Advisory Council (CARAC) at the next meeting in fall 2011 as the basis for amendments to the rules that would be consulted using the accelerated process.

Transport Canada has further initiated a comprehensive review of other offshore helicopter operations (such as North Sea operations) and the existing Canadian regulatory framework to determine if other specific regulations are required.

Transport Canada will also continue to work with the Canada Newfoundland and Labrador Offshore Petroleum Board (CNLOPB) enquiry (sic) and the resulting recommendations, expected by the fall of 2011 that may need to be taken account of in changes to the rules."

### **Board assessment of Transport Canada's response to Recommendation A11-04 (June 2011)**

In its reply, TC indicated that during the summer of 2011, a focus group will complete a review of the recommendation related to making supplemental breathing apparatus mandatory for all occupants of helicopters involved in overwater flights where PTSS are required.

Depending on the outcome of these discussions, TC will publish an advisory bulletin. In addition, it will submit the results to CARAC, as the basis for amendments to the rules. TC has also indicated it will be using an accelerated process to consider amendments to the rules.

If rules requiring supplemental breathing apparatus are put in place they will significantly reduce the risk to passengers of helicopter overwater flights.

Therefore, the response is assessed as **Satisfactory Intent**.

### **Transport Canada's response to Recommendation A11-04 (September 2011)**

"Transport Canada completed a Focus Group meeting (August 8th through 12th, 2011) which reviewed TSB Recommendation A11-04. The Focus Group proposed that performance-based regulations be drafted to meet the intent of the TSB Recommendation. These proposals were subsequently examined in depth and agreed-to by TC senior management at a CARC meeting in early September. The process is currently underway to initiate the drafting of appropriate regulations, using an accelerated process.

Target for completion is December 2012."

On 17 January 2012, TC advised that an advisory bulletin, originally planned for publication in the fall of 2011 would be published by the end of March 2012.

On 28 March 2012, TC submitted an update stating the following:

"Following the results of the focus group which took place in the summer of 2011, proposed regulations are being developed. A Notice of Intent has been sent to stakeholders for comment on the policy objectives. The amendment to the CARs introduces a new definition of an Emergency Underwater Breathing Apparatus (EUBA) and a new requirement for the mandatory carriage of EUBA for passengers and crew members limited to offshore operations in Canadian waters. TC is also proposing a modification to introduce training requirements for appropriate usage of an EUBA."

In addition, TC provided an explanation of its accelerated rulemaking process.

"Recommendations A11-06, A11-05 and A11-04, A11-03 are part of a pilot project initiated by TCCA introducing an accelerated rulemaking process. Two risk analysis focus groups were formed (involving industry representatives) resulting in recommended actions. As part of the next steps, CARAC members received a Notice of Intent indicating what regulatory changes are proposed and were invited to provide comments. The drafting of the proposed regulations by the Department of Justice and the public consultation take place simultaneously; the proposed regulations are finalized only after the public consultation period has closed and comments have been disposed of."

### **Board reassessment of the response to Recommendation A11-04 (March 2012)**

A Transport Canada focus group has proposed performance-based regulations be drafted to meet the intent of the TSB Recommendation and this has been accepted by TC senior management. An accelerated process to draft the new regulations and complete the process is currently underway with a target date for completion set for December 2012. If these new

regulations meet the intent of Recommendation A11-04, when fully implemented, they may substantially reduce or eliminate the safety deficiency as described in Recommendation A11-04.

Therefore, the response is assessed as **Satisfactory Intent**.

### **Transport Canada's response to Recommendation A11-04 (December 2012)**

In its 04 December response, TC provided the following information:

(Industry is complying with these recommendations without regulation through the Canadian Newfoundland Labrador Offshore Petroleum Board (C-NLOPB))

As part of the accelerated rulemaking process, a focus group was held in the summer of 2011. Amendments to the regulations will be pre-published in the Canada Gazette Part I as soon as possible, likely in early 2013.

In an email dated 12 December 2012, TC provided the following clarification:

TC is expecting the draft regulations to be pre-published in Gazette 1 in early 2013. Should there be no unforeseen issues, TC is anticipating the regulations to be published in Gazette 2 late in 2013.

### **Board reassessment of the response to Recommendation A11-04 (March 2013)**

In its response, TC indicates that the offshore oil industry is following these recommendations without regulation. However, the intent of Recommendation A11-04 was that supplemental underwater breathing apparatus be mandatory for all occupants of helicopters involved in overwater flights who are required to wear a PTSS, for all operators, not only Newfoundland operators. Therefore, it is important that progress continues on the new requirement for the mandatory carriage of EUBA for passengers and crew members of offshore operations in Canadian waters.

TC anticipates that amendments to the regulations will be pre-published in the *Canada Gazette* Part I in early 2013 and then be published in Gazette Part 2 late in 2013.

While in January 2012, TC indicated that an advisory bulletin would be developed for publication in March 2012, as of 18 December 2012, no update on the status of this advisory bulletin was provided.

Therefore, the response is assessed as **Satisfactory Intent**.

### **Transport Canada's response to Recommendation A11-04 (November 2013)**

Proposed regulations that address this recommendation were pre-published in Part I of the *Canada Gazette* on 16 November 2013.

### **Board reassessment of the response to Recommendation A11-04 (April 2014)**

In its response of 04 December 2012, Transport Canada indicated that the offshore oil industry in Canada is already following these recommendations without regulation. TC has also now finalized a new regulation that will require that supplemental underwater breathing apparatus

be mandatory for all occupants of helicopters involved in overwater flights who are required to wear a passenger transportation suit system (PTSS). This new regulation was published in Part I of the *Canada Gazette* on 16 November 2013, and if it comes into effect, the action that TC has taken will substantially reduce the safety deficiency.

Therefore, the response is assessed as **Satisfactory Intent**.

### **Transport Canada's response to Recommendation A11-04 (April 2015)**

TC announced the coming into force of amendments to the *Canadian Aviation Regulations* that will require offshore helicopter operators to provide an emergency underwater breathing apparatus (EUBA) to each crew member and passenger on board and train them how to use it properly.

The objectives of these amendments are to reduce the risks associated with offshore operations flights by ensuring that future offshore flight operators follow a consistent national standard, to further harmonize the Canadian regulations with the International Civil Aviation Organization (ICAO) standards and best practices, and to address the TSB's recommendations. These amendments will also eliminate the risks associated with requiring crew members to wear survival suits inappropriate to their duties.

These amendments will

- introduce a definition of "emergency underwater breathing apparatus (EUBA);
- require the carrying of EUBAs for all occupants of helicopters involved in offshore operations flights in Canadian domestic operations where occupants are required to wear a helicopter transportation suit system;
- introduce a requirement that crew members and passengers be trained in the use of EUBAs;
- correct section 602.63 of the CARs, "Life Rafts and Survival Equipment – Flights over Water," to replace the requirement that crew members wear helicopter passenger transportation suits with a requirement that crew members wear a crew member transportation suit (one of the main differences between the two suits is the fact that the crew transportation suit system has a different thermal insulation than the passenger suit system);
- incorporate by reference the Helicopter Passenger Transportation Suit System (HPTSS) standards into section 602.63 of the CARs via the Airworthiness Manual (AWM).

### **Board reassessment of the response to Recommendation A11-04 (May 2015)**

In its response from 28 April 2015, TC announced the coming into force of amendments to the *Canadian Aviation Regulations* that will require the carrying of EUBAs for all occupants of helicopters involved in offshore operations flights in Canadian domestic operations where occupants are required to wear a helicopter transportation suit system and introduce a requirement that crew members and passengers be trained in the use of EUBAs.

These new regulations will also require all crew members to wear a water immersion survival suit specifically designed for crew.

These regulations will come into effect in July 2015 and will align Canadian requirements with international standards and best practices for offshore helicopter operations.

This action will substantially reduce the safety deficiency identified in A11-04 and therefore the Board re-assesses TC's response to the recommendation as being **Fully Satisfactory**.

**Next TSB action**

The deficiency file is **Closed**.