

Offshore Helicopter Safety Inquiry

Phase II Submission

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This submission for Phase II is in response to the Aviation Investigation Report A09A0016 issued by the Transportation Safety Board of Canada into the Cougar Helicopters Inc. crash on March 12, 2009. ("Transportation Safety Board Report")

In keeping with my request for standing and my remit with respect to the inquiry and submissions in relation thereto, I will restrict myself to commenting on the aspects of the report that can be considered to impact search and rescue capability and responsiveness in the Newfoundland and Labrador offshore.

1. Emergency Flotation Systems

The Rotorcraft Flight Manual (RFM) for the S-92A stated that the helicopter's emergency flotation system (EFS) was "designed to keep the helicopter upright and afloat long enough for all crew and passengers to evacuate the aircraft in mid sea state 5 (wave height of 8-12 feet with a wind speed of 18-24 knots) sea state" (TSB Report, page 16).

However, according the Transportation Safety Board Report, page 129:

"CH191 was equipped with an EFS system certified for sea state WMO 4. Given the high probability of encountering sea state conditions greater than 4 (i.e., a "hostile environment") in the waters off Newfoundland, without the use of helicopters equipped to provide ditching stability in excess of sea state 4 conditions, immediate capsizing is highly probable, increasing the risk of loss of life during a ditching scenario."

And at page 130:

"In the event of a survivable crash at sea, a helicopter's EFS is one of the primary defences to reduce the possibility of occupant fatalities due to drowning.

Currently, EFS only need to meet the certification requirements of a controlled ditching, despite the fact that research has shown that crashes into the water happen almost as frequently as ditchings. In a crash situation, there is a risk that the EFS may be disabled by the impact forces and that the occupants drown before they can successfully escape from the sinking helicopter. The CH191 accident is one example where occupants survived the crash impact only to drown in the rapidly sinking helicopter before they could escape."

The sea state 4 capability referenced above is based on the helicopters being equipped with "Three Bag EFS Kits."

The TSB Report, at page 149, quotes Environment Canada statistics indicating that sea state 4 is exceeded approximately 50% of the time throughout the year and 83% of the time between December and February. Even sea state 6 is exceeded 3.3% over the year and approximately 9% of the time between December and February.

The response to date to the issue of providing stability in the hostile environment of the Newfoundland Offshore after ditching has been addressed in part by the installation of “Five Bag EFS Kits” to 3 of the S-92As operated in St. John’s by Cougar. Although a 4th was to be installed in January of 2011 (see TSB Report, para.4.1.4.13 at page 144) a report in the St. John’s Telegram of February 11, 2011 notes information from the Canadian Association of Petroleum Producers indicating that only 3 helicopters are equipped with sea state six flotation systems.

One further issue with respect to the need for adequate flotation is the question of ability to deploy. As noted by the Transportation Safety Boards Report at p. 130:

“If offshore helicopter EFS systems are only designed to withstand the force associated with a ditching there is a continued risk that these systems will be disabled in survivable impacts contributing to occupant deaths from drowning. While CHI91 is only the second offshore helicopter accident in Canada, there is an important risk due to the large numbers of workers being transported to offshore facilities not only in Canada but internationally.”

The offshore operators have determined that they would not conduct helicopter operations offshore when the sea state is greater than six, and in the case of the other helicopters still only equipped for the sea state 4 condition, they would not be operated in sea states greater than 4.

The TSB Report recommends (page 149) that Transport Canada prohibit commercial operations of Category A transport helicopters over water where the sea state will not permit safe ditching and successful evacuation. It is not known whether Transport Canada has yet adopted such a regulation.

Despite these improvements the risks will remain high for occupants of helicopters transported over water in the Newfoundland and Labrador offshore. As noted by the TSB Report, twin engine helicopters invariably turn upside down when EPS systems do not operate successfully.

And, as noted above, approximately one-half of the incidents involve crashes into the water as opposed to controlled or semi-controlled ditchings. And the TSB reports that the EFS systems are often disabled or cannot operate in such crashes.

The consequences are that in the event of an incident there is serious likelihood that occupants will be in the water in less than ideal circumstances and in need of the swiftest possible rescue.

It is also worth noting that the improvements made as a result of better EFS, as well as the other recommendations of both the Phase I Report and the TSB Report should also give rise to the increased likelihood of multiple survivors of a crash or ditching of a helicopter which is greatly to be desired.

The result is a significant improvement but highlights the caveat that the industry first response Search and Rescue capability is just that, a first response. The importance of the second response, provided by the Department of National Defence, is heightened. The more people in the water in need of rescue, the greater the need for search and rescue capability adequate to the circumstances.

The need for the second responder to get airborne quickly is especially true the farther away from the coast any incident may occur, and is of greatest significance outside the 8:00 a.m. to 4:00 p.m. weekday period the response time for DND Search and Rescue is when increased to 2 hours from 30 minutes.

2. Emergency Locator Transmitters

The TSB Report states at page 147:

“If an aircraft crash occurs over land, an ELT that survives a crash will normally transmit at full strength after the required 50-second delay. In a helicopter crash in water, there is a strong possibility that a fixed ELT antenna will end up below the surface of the water before the 50-second delay has elapsed. In this case, it is possible that the ELT signal will be badly attenuated and rendered incapable of detection by the COSPAS-SARSAT satellite system.

As shown in this occurrence, without an immediate signal being transmitted from an ELT installation, water attenuation of a useable ELT signal from a submerged aircraft may continue. This increases the risk of an ELT signal not being received and SAR resources not being launched in a timely manner.”

Although no recommendation is made by the TSB concerning this issue, it is important that ELT equipment be used that can be certain to transmit in a timely manner or deploy

in such a way as to avoid the situation encountered in the crash of CH191 and the Commission should consider such recommendation.

3. Need for Personal Locator Beacons

The TSB Report states at page 128:

“PLB are not required by Canadian aviation regulation for the occupants of a helicopter flying prolonged distances over water. As a result, there are no aviation standards for their design, function, and performance capabilities. Unlike the PLBs used by the occurrence flight crew, the PLBs carried by the passengers of CHI91 were designed for a man overboard situation and did not transmit on 406 MHz. As a result, they would not have been detected by the COSPAS-SARSAT satellite system, which would provide location information to SAR personnel following a ditching or crash at sea. Without a helicopter occupant PLB regulation and standards, inappropriate PLB types may be selected for helicopter transportation, resulting in delays locating a person floating in the ocean.”

Despite the lack of a regulation requiring personal locator beacons for helicopter passengers over water, the report notes that the PLB's in use at the time of the Cougar crash by the passengers were designed for a man overboard situation and did not transmit on the band which would have permitted easier location by SAR personnel attempting to find a person floating in the water. However those in use by the flight crew did.

Even without a change in Transport Canada regulations it would be desirable to ensure that passengers were equipped with suitable Personal Locator Beacons in the Newfoundland and Labrador offshore and the Commission should consider such a recommendation.

4. Significant Finding as to Risk

On page 134 the Transport Safety Board Report paragraph 3.3 (2) states:

“In distant offshore operations, including the East Coast of Canada, a 30 minute run dry MGB capability may not be sufficient to optimize eventual landing opportunities.”

On page 148 the TSB Report states:

“If a helicopter has to ditch in hostile waters such as those off Canada’s east coast, the occupants are at considerable risk. Many of these offshore facilities now have flight times over 2 hours and future development of offshore petroleum resources include plans for facilities even further from land.

“Available information indicates that other helicopters are now capable of dry run performance that exceeds 30 minutes. It may now be both technically feasible and economically justifiable to produce a helicopter that can operate over 30 minutes following a massive loss of MGB lubricant.

“Therefore, the Board recommends that:

The Federal Aviation Administration assess the adequacy of the 30 minute main gearbox dry requirement for Category A transport helicopters.”

Even with the existing standard of a 30 minute dry run requirement, it is clear that the “extremely remote” exception is no longer viable and not acceptable to regulators.

The TSB Report states at page 147:

“Category A rotorcraft certified under the "extremely remote" criteria may not be capable of continued operation for 30 minutes with only residual lubrication. These helicopters remain vulnerable to gearbox failures stemming from unforeseen massive losses of MGB lubricant, placing passengers and crew at risk.

Therefore, the Board recommends that:

The Federal Aviation Administration, Transport Canada and the European Aviation Safety Agency remove the "extremely remote" provision from the rule requiring 30 minutes of safe operation following the loss of main gearbox lubricant for all newly constructed Category A transport helicopters and, after a phase-in period, for all existing ones.”

And, importantly, the Transport Safety Board Report advises at page 104:

“With the exception of the S-92A, all other Category A helicopters certified by the FAA, the JAA [Joint Airworthiness Authority], and TC [Transport Canada] to Part 29.927(c)(1) or its equivalent, have met the requirements by draining the MGB then continuing operation using only residual oil for 30 minutes.”

It appears then that despite the obscurity of the wording and recommendations, the only aircraft that doesn't meet the requirement of a 30 minute dry run capability is the one being used for transport in the Newfoundland and Labrador offshore.

Even the S-92A may in the future meet this standard. According to information provided to the Standing Committee on National Defence, the S-92A aircraft being purchased by the Canadian government, modified for military use and named the Cyclone, will be required to meet the 30 minute run dry capability, and Sikorsky is developing the technology required.

This discussion and the recommendations above raise significant concern with respect to the operation of the S-92A in our offshore conditions. The comments of the Transportation Safety Board and recommendations lead inevitably to the conclusion that the S-92A, without the 30 minute run dry capability, is not a suitable aircraft for use in the conditions which exists in the Newfoundland and Labrador offshore environment.

This helicopter is unable to successfully land in the event of a MGB failure and may be required to ditch or potentially crash in hostile conditions providing a great risk to passengers and crew.

If the Transportation Safety Board has concluded that all new helicopters should meet the 30 minute run dry requirement and all existing ones must also, after a phase-in period, it should be unacceptable for use in the hostile conditions of the Newfoundland and Labrador offshore during the "phase-in period."

It therefore calls into question the continued use of the S-92A in the Newfoundland and Labrador offshore and the Commission should consider requiring alternative aircraft to the S-92A or placing even further restrictions on operations to reduce the risk to the lives and safety of helicopter passengers and crews.

It also further exacerbates the crucial need for adequate search and rescue capability and response times for both first and second responders, given the risks, distances from land, and the hostile environment in which this helicopter transport takes place.

All of which is respectfully submitted this 15th day of April, 2011, by

Jack Harris, Q.C.