

Report:
Level of Service Requirements for First Response Helicopters

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Background

This report was prepared to provide level of service requirements for the first response helicopter for the NL offshore industry (hereafter, “the first response helicopter”) as well as to clarify to the Operators and helicopter service providers, what the C-NLOPB’s expectations are in this area. In short, the Offshore Helicopter Safety Inquiry (OHSI) report did a very good job describing the equipment needed for the rescue helicopter, but did not discuss thoroughly the capabilities of that first response helicopter or the skills and training necessary to safely conduct first response operations.

A team of Operator, workforce, Cougar, and Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) personnel – the “OHSI Implementation Team” – was convened by the C-NLOPB in 2011 to provide advice to the C-NLOPB on implementing the recommendations of the OHSI. The Team conducted an in-depth study of the first response helicopter support provided by Cougar Helicopters at the time (spring 2011), on both equipment and personnel. The Team’s work (their “Advising Document” on OHSI Recommendation 2) was completed in June 2011 and their conclusions and recommendations were presented, reviewed, and accepted in principle by the Board. The document was subsequently forwarded to the Operators. Since that time, the C-NLOPB has conducted a more thorough review of the recommendations. Although the essence of the level of service was described in the Advising Document, there were a number of areas such as training and standards of the first response crew, which needed further clarification. In doing so, it is hoped that the expectations of the workforce, Regulator, Operators and Service Provider will be more aligned.

At the request of the C-NLOPB Chair and CEO, a working group was formed to review the Implementation Team’s Advising Document and identify those areas which needed clarification or expansion. The working group consisted of Major Kevin Grieve (DND Senior Staff Officer, SAR), Dr Martin Leahy (CCFP[EM], Dept Emergency Medicine, Queensway Carlton Hospital), MWO Greg Smit (Senior SAR Tech Advisor, DND), Max Ruelokke (Chair and CEO, C-NLOPB), and Peter McKeage (Aviation Advisor to the C-NLOPB). The group met in Ottawa on 8 September, 2012. Dr. Leahy was unavailable to attend the sessions, but did review the working group’s recommendations from a clinical aviation medicine perspective. His comments and advice have been incorporated into this report.

Aim

The aim of the working group was to review the OHSI Advising Document and, where necessary, provide expanded guidance to the Board so that the C-NLOPB may better define the level of service for the first response helicopter.

Assumptions

1. The collective goal of all stakeholders is to reduce the safety-risks associated with the first response helicopter's "first response services" to a level as low as reasonably practicable;
2. The Operators are responsible for *establishing performance requirements* for the helicopter service provider, and for *measuring and providing feedback* to the helicopter service provider regarding its safety performance and level of service; and
3. The C-NLOPB is responsible for providing performance-based goals to the Operators for "first response" helicopter operation as well as measuring the effectiveness by which helicopter-related safety-risks are managed – by the Helicopter Service Provider and by the Operators.

Discussion

The following topics were identified by the working group as areas in the Implementation Team's Advising Document needing further clarification.

Definition of First Response: The definition of first response and the expectations for what the first response helicopter and crews should be able to provide, have not been clearly defined by either the OHSI, the C-NLOPB, nor the OHSI Implementation Team. One of the first tasks for the working group was to answer the question of "what is meant by the term first response?"

After a great deal of discussion, two key points emerged:

- The rescue of survivors from a crash or planned ditching scenario will be a collaborative effort led by the JRCC Halifax and coordinated by on-scene DND assets when they do arrive (as per the present DND/Cougar Helicopters protocol)¹.
- The rescue helicopter's primary role is to extract and provide immediate medical assistance to the injured survivors while enhancing the survival chances of those persons who may not be able to be airlifted on the first aircraft. This latter circumstance could involve the deployment of a rescue specialist and/or lightweight Survival Kits Air Deployable (SKADs); to remain with those survivors until safe extraction is possible.

¹ The "collaborative" nature of the roles and responsibilities mentioned, are more clearly defined in the protocol between Cougar and DND for rescue operations as included in the Operators' Advising Document regarding OHSI Recommendation 4.

Decades of marine rescue operations have demonstrated that the greatest threat to survival in open water will be hypothermia due to exposure (time) or leaks in the survivors' immersion suits. The worst-case scenario would be a survivor or survivors stranded outside the life raft, possibly with secondary injuries. An important point made by MWO Smit and reinforced by Dr. Leahy was that in any marine rescue environment, the three most important actions that can be taken to save a person suffering from hypothermia are:

- Extract the survivor from the water – as level as possible (rescue basket);
- Apply an external heat source (aircraft cabin heat, heated blankets, remove wet clothing etc.) to stop any decrease in core body temperature; and
- Evacuate the survivor to a proper medical facility ASAP.

When discussing the expectations for the level of service for the first response helicopter, it is important to consider the limitations of the aircraft and crew as well as to understand that the nature of injuries of some survivors may preclude extraction of all survivors on the first lift. In the context of marine rescue, no standard operating procedure (SOP), SAR manual, or training can anticipate or fully prepare a rescue crew for all circumstances that may arise during a rescue. Therefore, it is important that survival training schools and offshore workers embrace the reality that there is always the possibility of significant delays from the time a person enters the survival situation until they are extracted and transported to safety.

Equipment: On the subject of first response, Commissioner Wells primarily focused his recommendations on the critical equipment necessary for the helicopter, including; dual hoist, auto hover; night sun, FLIR, etc. There was little scrutiny of the type of medical/rescue equipment required on board the helicopter or, more importantly, the training or standards required by the Rescue Specialists themselves². The Implementation Team's Advising Document recognized this "gap" and provided more detail to the Board; however, upon further reflection it has become clear that a number of the operational expectations and the minimum equipment required to conduct first response operations need to be further defined.

- Rescue Basket: A standard piece of equipment for first response helicopter operations worldwide is the Rescue Basket. Its success stems from the capability it provides to lift a survivor out of harm's way (from almost any environment) with little or no assistance. In the marine rescue environment, the Rescue Basket provides a safe and rapid method for lifting a hypothermic patient out of the water in a relatively level position, significantly reducing the chances of the patient going into shock. Therefore, the Rescue Basket should be considered essential equipment on all first response helicopters.

² The term **Rescue Specialist** is a new title the working group believed should replace the term "Rescueman" currently being used at Cougar. The reason for the change will become evident as qualifications and recommended crew training standards are discussed.

- Horse Collar Rescue Device: Up until the advent of the Rescue Basket, the Horse Collar was the standard means for rapidly lifting (non-seriously injured) personnel out of harm's way. This equipment brings a great deal of speed and flexibility to the rescue crew in a multi-lift scenario and should be considered an essential piece of equipment for all first response helicopters.
- Stokes Litter/Guideline Hoisting: One of the most important methods for removing a seriously injured person out of harm's way is by utilizing a Stokes Litter. This is particularly true when operating from confined areas such as small vessels or platforms where the helicopter cannot land. Therefore, having the ability to recover an injured patient using a Stokes Litter (with guideline) should be considered an essential capability of the first response helicopter and crew.
- Medical Kits: Presently, the first response helicopter carries a lightweight penetration kit with contents suitable for basic first aid (trauma type injuries and CPR) for a limited number of survivors. Given the fact that space and weight in a helicopter will always be a limiting factor, it was felt by the working group that a reasonable expectation would be that enough medical equipment should be on board to sustain up to 21 survivors presenting predictable, non-life threatening injuries. Newer, more sophisticated lightweight medical kits³ should be considered a minimum.
- Casualty Bags/Heat Blankets: Accepting the fact that some degree of hypothermia will likely be present for most or all survivors, it will be important that efficient methods exist to warm survivors on board the helicopter. Casualty bags or heating blankets⁴ should be on board the first response helicopter and be available to the Rescue Specialists – for up to 21 survivors.
- Oxygen: O₂ is considered a basic life-sustaining drug and a minimum requirement for medical transport helicopter operations nationally. Currently, the first response helicopter is carrying standard Oxygen cylinders used by paramedics and first response vehicles on the ground. These can weigh as much as 20 pounds and offer only a limited amount of Oxygen supply (less than 1 hour) to a single patient. Lighter, more efficient oxygen cylinders⁵ should be considered as part of the minimum equipment list for the first response helicopter, as well as any helicopter engaging in medevac operations.

³ Such as the "2ndLine" pack: <http://www.ctoms.ca/products/2ndline-main-pack?cat=26>

⁴ Such as the "Ready-Heat" blanket: <http://www.ctoms.ca/products/ready-heat-blanket?cat=47>

⁵ Example of light weight O₂ supply:

http://www.fernocan.com/product_listing.aspx?sol=1&cat=10&subcat=69

- Compressed Air Breathing Apparatus (CABA): In recommending the availability of a light weight CABA⁶ for the Rescue Specialists, the working group acknowledged the increased risks associated with rescue swimming in the difficult environmental conditions offshore NL. The intent of this equipment is to provide a surface swimming capability with the aid of compressed air; not a dive capability. The working group considers CABA a minimum equipment requirement for Rescue Specialists conducting extended rescue operations in the cold North Atlantic, in large sea states (day/night – sea state 6) and under the spray and downwash of the first response helicopter. The addition of this capability will significantly reduce the risks for the Rescue Specialist to a level as low as reasonably practicable while enabling them to safely conduct protracted open water rescue.

Capabilities of the first response helicopter: The Implementation Team’s Advising Document provided guidance for the demonstrated capability of the first response helicopter (pp. 7-8):

The Operator(s) shall ensure that the First Response provider can demonstrate the ability of the First Response aircraft and crews to affect the following in Day or Night Instrument Meteorological conditions (IMC) conditions:

- *Effect offshore landing and departure;*
- *Hoist from an offshore facility;*
- *Hoist from water;*
- *Hoist from a supply vessel;*
- *Hoist from a life raft;*
- *Deploy SKAD kits;*
- *Provide medical assistance to casualties (post rescue); and*
- *Conduct expeditious airborne search for survival craft and personnel in water.*

Hoist from water/life raft/supply vessel: The present service provider, Cougar Helicopters, requires quarterly training for all Rescue Specialists and hoist operators for water hoist pick-ups from open water and vessels. The skill sets required for this type of work are core requirements for all marine rescue crews and are considered “perishable skills”. Therefore, the number of training hours necessary to maintain *proficiency* in these skill sets (by all rescue crews) should be considered a minimum requirement with the necessary hours supported by the Operators.

⁶ Example of a lightweight CABA: <http://www.interspiro.com/product-mk2.htm> and http://www.interspiro.com/downloads/98607C01_Divator_Lite_product_leaflet_L.pdf

SKAD Kits: Consistent with the Implementation Team’s Advising Document, the first response helicopter presently carries one SKAD kit for operational deployment. Although the Implementation Team did address this capability, there has been no specific guidance to the Operators or service provider on the number of kits required or to provide proper maintenance and training. The consensus of the working group is that three such kits should be a minimum to maintain this capability: one SKAD kit on board the first response helicopter, one in maintenance and one spare kit for training purposes as required.

Night Vision Goggles (NVGs): The Implementation Team identified NVG technologies for the Rescue Specialist as a minimum capability. However, the working group believes that the full potential of this technology cannot be safely realized without all first response aircrew being NVG-capable. In keeping with this philosophy, Cougar has already initiated NVG qualification training for all first response aircrew. The number of continuation training hours required for the training syllabus is still being determined but once this work is completed, the required hours needed to maintain NVG *proficiency* should be considered a minimum.

Training/Qualifications for Rescue Specialists: One important area not explored in great depth in the OHSI report is the qualifications and skill sets required by the aircrew of the first response helicopter. The Implementation Team’s Advising Document provided good guidance for the critical capabilities of the first response helicopter, but did not directly address the qualifications or training requirements to meet those capabilities. This is especially true for the Rescue Specialist.

The working group set about reviewing a number of potential marine rescue scenarios that the first response helicopter likely would encounter and the kinds of skill sets that would be involved in effecting a successful rescue. Importantly, the discussions focused around the premise that this is a *civilian* first response helicopter; not a DND SAR helicopter. The working group was sensitive to the needs of the Helicopter Service Provider to maintain essential qualifications for first response while minimizing (where possible) the burden of annual and quarterly currency certifications.

The working group identified that, overall, the Rescue Specialists are responsible for effecting rescue and extrication of survivors. Two main qualifications were identified as requiring special skill sets for the Rescue Specialist. They were: Rescue Swimming and Medical Aid.

- Rescue Swimming: As a minimum qualification, the working group unanimously agreed that the Rescue Specialist should be an accomplished swimmer; comfortable in all marine survival conditions. As a minimum, the Rescue Specialist should be a certified diver (PADI or NAUI Advanced Diver or equivalent). The working group believes this standard, combined with aircrew medicals and routine endurance training will ensure the necessary confidence and skill levels will be available for first response Rescue Specialist duties while

minimizing the risks associated with marine rescue to a level as low as reasonably practicable.

- Medical Aid: In keeping with the first response philosophy described above, the working group believes that the first aid/medical qualifications presently maintained by Cougar Rescue Specialists are sufficient for the first response mission. This requires that all Rescue Specialists are St. John Ambulance First Aid/CPR qualified (recertified annually) to Advanced Medical First Responder Level 2 or higher. This is consistent with Canadian Coast Guard Rescue Specialist course training standard (Ref. 1).
- Maintenance of Rescue Equipment: With the sophistication of the newer rescue equipment, NVGs, Medical Kits, helmets and SKAD kits, it will be necessary for a proper maintenance support plan to be implemented by the Operators and the Helicopter Service Provider to ensure that the life support and rescue equipment is operationally ready at all times.

Conclusion

Until now, neither the C-NLOPB, OHSI, nor the OSHI Implementation Team has clearly defined the level of service expected of the first response helicopter. In September 2012, the C-NLOPB Chair and CEO formed a working group of subject matter experts with the aim of defining more clearly what the expected role of the first response helicopter is and, secondly, to develop reasonable expectations for the capabilities and skillsets necessary to fulfill that mandate.

The role of the first response helicopter was defined as having two components:

- The rescue of survivors from a crash or planned ditching scenario will be a collaborative effort led by the JRCC Halifax and coordinated by on-scene DND assets when they do arrive (as per the present DND/Cougar Helicopters protocol)⁷.
- The first response helicopter's primary role is to extract and provide immediate medical assistance to the injured survivors while enhancing the survival chances of those persons who may not be able to be airlifted on the first aircraft. This latter circumstance could involve the deployment of a rescue specialist and/or lightweight Survival Kits Air Deployable (SKAD kits); to remain with those survivors until safe extraction is possible.

⁷ The "collaborative" nature of the roles and responsibilities mentioned, are more clearly defined in the protocol between Cougar and DND for rescue operations as included in the Operator's Advising Document regarding OHSI Recommendation 4.

From this definition, the essential equipment necessary for safely conducting first response rescue services was identified, including:

- Rescue Basket
- Horse Collar
- Stokes Litter/Guidelines
- Survival Kits Air Droppable (SKAD Kits);
- Medical kits for the rescue specialist suitable for treating up to 21 survivors for hypothermia other non-life threatening injuries (while being evacuated to hospital);
- Casualty Bags and or Heat blankets for up to 21 survivors;
- Night Vision Goggles for all positions on the first response helicopter; and
- Portable Oxygen for use on medevac operations as well as during survivor transport.
- Compressed Air Breathing Apparatus (CABA)

Further to the development of the minimum equipment list, the working group then outlined the necessary skill sets required by the rescue crew, and more specifically the Rescue Specialists, to meet the expectations identified by the Implementation Team's Advising Document (Ref. 3). These skills/capabilities included:

- Effect offshore landing and departure;
- Hoist from an offshore facility;
- Hoist from water;
- Hoist from a supply vessel;
- Hoist from a life raft;
- Deploy SKAD kits;
- Provide medical assistance to casualties (post rescue); and
- Conduct expeditious airborne search for survival craft and personnel in water.

The working group acknowledged that the skills required to conduct first response helicopter duties were considered perishable and that clear guidance was needed to ensure the crews maintained the necessary capabilities to conduct rescue operations in day or night (IMC) conditions. For the most part, the working group's focus on training was towards the needs of the Rescue Specialist. However, in areas such as NVG training, the advice provided was generic to the first response crew, including pilots and flight engineer (Hoist Operator). From a crew perspective, this included training for:

- Deployment of SKAD Kits;
- Water hoisting and survivor pick-ups from open water, life rafts and supply-type vessels;
- NVG qualification training and subsequent continuation training to maintain proficiency as a crew;

From a Rescue Specialist perspective, the working group identified three main capabilities and qualifications for the Rescue Specialist:

- Meet or exceed the 2009 Canadian Coast Guard *Rescue Specialist Course Training Standard* (Ref. 1)
- Meet or exceed PADI or NAUI Advanced Diver certification or equivalent
- Meet or exceed the medical standard of St. John Ambulance Advanced Medical First Responder Level 2 or higher (annual recertification)

Recommendation

That the C-NLOPB communicate to the Operators the expectations, equipment, and skill sets necessary for the Helicopter Service Provider to conduct safe and effective first response helicopter service for the NL offshore industry.

References

1. Canadian Coast Guard (2009). *Rescue Specialist Course Training Standard*. Ottawa, ON.
2. Cougar Helicopters/DND Protocol, Version 1.1 (2011). As attached to the Newfoundland and Labrador offshore operators' *Advising Document: OHSI Phase I, Recommendation 4*. http://www.cnlopb.nl.ca/pdfs/ohsi/adv_recommendation4.pdf.
3. OHSI Implementation Team (2011). *Advising Document: OHSI Phase I, Recommendation 2*. http://www.cnlopb.nl.ca/pdfs/ohsi/adv_recommendation2.pdf.
4. Wells, Robert (2010). *Offshore Helicopter Safety Inquiry. Phase 1. Volume 1: Report and Recommendations*. St. John's, NL: Canada-Newfoundland and Labrador Offshore Petroleum Board.