Advice provided by the C-NLOPB's Offshore Helicopter Safety Inquiry (OHSI) Implementation Team to the C-NLOPB Board

Advising Document
OHSI Phase I, Recommendation 11
Regarding overview of helicopter fleet size

CANADA-NEWFOUNDLAND and LABRADOR OFFSHORE PETROLEUM BOARD

In November 2010, the Honourable Robert Wells, QC, submitted the Report for Phase I of the OHSI to the C-NLOPB, containing 29 recommendations for enhancing the safety of helicopter travel offshore. Each Advising Document contains the text of the recommendation for which the advice is offered.

The Team's advice for Recommendation 11 was accepted in principle by the C-NLOPB Board at their meeting on April 28, 2011. At that time, the C-NLOPB took responsibility for developing its strategy to implement the recommendation.

The OHSI Reports, other Advising Documents, C-NLOPB OHSI Action Plans, and more can be found on the C-NLOPB website: **http://www.cnlopb.nl.ca/ohsi_main.shtml**

Advice to the C-NLOPB: Recommendation 11

Recommendation

It is recommended that helicopter fleet size should continue to be decided by the oil operators. The Regulator should monitor the fleet size to ensure that it is sufficiently large at all times to maintain helicopter safety.

Method

A working group of the C-NLOPB's OHSI Implementation Team reviewed the recommendation, identified a potential system safety deficiency, and developed an implementation plan. The group reviewed operating factors that can affect fleet size, identified local influencing factors (weather, etc.), and acquired additional information and data from the Operators, subject matter experts, and other third parties. The group then identified performance metrics for monitoring and evaluating the effects of fleet size and subsequently prepared documentation for review by the entire Team. Changes were made to reflect the discussion before the final proposal was submitted to the Board for its consideration.

The working group determined that the implementation plans for Recommendations 1, 2, 9, 10, and 12 might have an effect on fleet size.

System Safety Deficiency

None identified (refer to Discussion section).

Potential System Safety Deficiency

There is no comprehensive regulatory oversight of the Operators' protocol to monitor the potential hazards resulting from helicopter fleet size in the C-NL offshore.

Background

Over the past 14 years, there have been fluctuations in offshore Persons On Board (POB) with corresponding changes in the size of the helicopter fleet. Examples of fleet size changes are summarized in the table below:

Year	Operator	Change in operations	Change in Helicopter Fleet
2005 / 2006	Husky Energy	Summer drilling campaigns utilizing the RGVI resulting in additional offshore POB	Sikorsky S-61 contracted in addition to core AS332L / S-92 Fleet
2006-2007 / 2010	Chevron	Drilling operations in Orphan Basin	S-92 mobilized to support Chevron Scope.
2008-2009	Statoil	Henry Goodrich operations in Flemish pass (change in distance from heliport as opposed to POB increase)	S-92 mobilized to support Statoil Scope.
2009-2010	Conoco-Phillips	Drill Operations in Laurentian Basin	S-92 mobilized to support Conoco-Phillips scope
2010	Husky Energy, Suncor and Exxon-Mobil	Change in 1st Response SAR requirements	Long-term contract executed for a S-92
2010-2011	Husky Energy, Suncor and Exxon-Mobil	Night Flying Suspension	S-92 contracted to supplement core fleet during winter months

However, there have been occasions when the helicopter fleet has struggled to meet personnel movement demands due to prolonged periods of poor flying weather, extended helicopter maintenance requirements, and, more recently, changes in the local aviation industry since the crash of flight 491.

The Team was unable to find information that indicated that a regulator in any other jurisdiction monitors the industry's offshore helicopter fleet size.

The Operator considers the following elements when deciding on the number and type of helicopters required to support C-NL offshore passenger movement operations:

- Offshore POB
- Changes in offshore helicopter technology
- Type-approved flight and ground crew availability
- Availability of spares and maintenance support
- Helicopter terminal design and passenger handling capacity
- Operating area of offshore installations (distance from helicopter operations base)
- Platform design including helideck (location and motion characteristics)
- The availability of suitably equipped aircraft (minimum range, payload, anti-icing, Canadian certification, floatation equipment, 4-point harness, etc.)
- Special offshore projects such as helicopter flare tip changes, construction vessels, etc.

- Changes in operational flight restrictions (sea state limits, altitude, night flying, etc.)
- Changes in aircraft payload due to additional passenger PPE (HUEBA, suits, etc.)
- Changes in aircraft configuration that impact payload (additional floatation, auxiliary fuel tank, onboard safety equipment, etc.)
- 1st Response Search and Rescue (SAR) commitments, including crewing training and back-up aircraft requirements
- Heavy maintenance periods, (planned main gearbox changes, floatation installs, etc.)
- Operator policy regarding use of supply vessel for personnel transfer

It is important to note that due to the nature of the aviation industry and the unique requirements associated with the C-NL offshore, long lead times are often required to obtain additional aircraft (and air and ground crew) that are suitably equipped for the C-NL offshore.

It is this challenge that drives the requirement for continuous proactive monitoring of the factors that affect fleet size. Lack of proactive monitoring of trends may lead to poor decision making or to insufficient lead-time to ensure effective decisions on acquiring additional resources, whether it be additional aircraft and/or personnel.

Discussion

The Team considered whether an inadequate fleet size affects *helicopter* safety, as referenced in the recommendation, or *offshore* safety.

Given that many controls, protocols, and operational limits exist regarding helicopter travel in the C-NL Offshore, the number of aircraft in the fleet does not result in decisions to fly beyond any of the limitations. Regardless of whether there is one helicopter or 10 helicopters available to fly offshore, the helicopter crews can only fly when the operating criteria allow them to do so. Therefore, the Team concluded that fleet size does not appear to affect helicopter safety.

However, the Team considered fleet size in the context of ancillary effects on offshore safety; namely in terms of worker morale and fatigue, and the timely evacuation of an offshore installation.

Regular offshore work rotations are planned 21 days on and 21 days off, while ad hoc vendors may work varying shifts between 1 and 21 days. It is reasonable to expect delays in offshore travel given the harsh local operating environment. These delays can be compounded due to lack of serviceable aircraft, or fleet size in general in circumstances of extreme backlog (greater than three days). Backlog varies throughout the year, but is especially evident during the harsh winter months and during fog season (May to August).

It is the experience of the Team members that prolonged or regular delays negatively affect worker morale and increase worker fatigue. This concern has been recognized by the Operators and certain mitigating measures have been put in place, such as personnel transfers by boat and fatigue management programs for workers that are required to stay offshore beyond 21 days. The Team deemed these measures appropriate. As the Commissioner stated in his report, "No doubt the advantage of a larger fleet would be to clear backlogs of passengers more quickly. That may lessen the inconvenience, but I doubt that it would enhance safety, because both the present fleet and a larger fleet would still fly only in permissible weather" (Vol. 1, p. 204).

The Team also considered whether an inadequate helicopter fleet size would negatively affect the ability of an Operator to downman (fully evacuate) an installation in emergencies. To address this hazard, Operators focus their mitigating measures on emergency preparedness in order to complete downman activity ahead of foreseeable installation threats. An example of this proactive approach was the September 2010 downmanning of the GSF Grand Banks and the Henry Goodrich, ahead of Hurricane Igor. Although helicopter transport is the preferred means of precautionary evacuation for reasons of speed, efficiency, and safety, evacuation may be performed via the assigned standby vessel. In the event of an emergency with no warning, such as fire or explosion, evacuation efforts will be undertaken by installation-based emergency evacuation systems, such as lifeboats and life rafts.

Conclusion

The safety consequences of fleet size are difficult to measure precisely, in part because they are absorbed into day-to-day operational decision-making. Therefore, the focus needs to be on effective risk management and decision making regarding helicopter transportation, with a mechanism to assess periodically the effect that fleet size may be having on day-to-day risk management and overall offshore safety.

While it was not apparent to the Team that fleet size has an effect on *helicopter* safety, it is clear to the Team that an inadequate fleet size could affect *offshore* safety in terms of worker morale/fatigue and timely evacuation of an offshore installation, not withstanding the mitigating measures currently in place. For this reason, the Team believes that increases in POB offshore, location and level of offshore activity, and changes in helicopter operational requirements can affect flight operations in terms of the ability to move personnel in an acceptable timeframe, given reasonably expected weather and operational delays. The Team was unable to find studies to formally confirm their experience that delays result in fatigue and demoralization. Therefore, the Team recommends that research regarding the effects of transportation delays on worker morale, fatigue, and other causes of increased human error be initiated.

The Team concluded that the Operators should continue to make resource-based decisions regarding fleet size, and the C-NLOPB should evaluate the safety implications of these decisions. The C-NLOPB should regularly review the adequacy of the helicopter fleet size by analysing key

performance metrics (as outlined in Appendix A). Furthermore, the key performance metrics themselves should be evaluated periodically to ensure appropriateness of the data. Key performance metrics may be supplemented by worker feedback from the Safety Forum (as proposed in Recommendation 25), offshore JOHSC minutes, and the Board's annual JOHSC sessions.

The mechanism for review of fleet size should be through the Helicopter Operations and Safety Steering Committee (HOSSC) (as proposed in the Advising Document for Recommendation 20). This is in line with the views of Commissioner Wells: "The parties to the review [of fleet size] should be the oil operators, helicopter operator(s), Regulator, worker representatives, and stakeholders, in a formal committee structure" (Vol. 1, p. 204).

Appendix A
Guidance regarding C-NLOPB Oversight of Helicopter Fleet Size

Purpose

This document is intended to provide an engagement model for the C-NLOPB with Operators to enable the monitoring of helicopter fleet size. It identifies both potential influencing factors affecting the Operators' decisions on helicopter fleet size and the level of C-NLOPB oversight/monitoring recommended to ensure compliance with the intent of Recommendation 11 of the Offshore Helicopter Safety Inquiry.

Roles and Responsibilities

The Operators shall retain responsibility for setting fleet size to accommodate their specific workloads and POB levels. They are responsible for managing the associated safety risks.

The C-NLOPB shall be accountable to evaluate the results of the Operators' decisions regarding fleet size to ensure safety is not negatively affected.

Monitoring & Reporting

As a minimum, the following metrics/statistics should be provided monthly by the Operators to the CNLOPB.

- Forecasted activity (installation/locations)
- Actual POB/forecasted POB
- Passenger movements via vessel
- Passenger movement via helicopter
- On-time performance (passengers moved on day scheduled)
- Payload utilization
- Aircraft downtime - planned
- Aircraft downtime - unplanned
- Aircraft availability
- SAR Training hours (for pilots and SAR Techs)
- Total flight hours
- Weather Delay days (full and partial delay days broken down by onshore, enroute, and site)

Examples of indicators that should prompt further engagement with Operators:

- Unforecasted POB changes
- Year over year increases in vessel transfers
- Year over year increases in delayed passengers
- Increases in flight hours per aircraft from industry norms
- Changes in Installation operations area (closer/further from helicopter operations base)