



Backgrounder

Evacuation Capacity for Hibernia Platform

The History

Evacuation systems (lifeboats and liferafts) are designed on the basis of the International Convention for Safety of Life at Sea (SOLAS) standard, which uses an average passenger weight of 75 kg. The Health and Safety Executive (HSE) of the United Kingdom issued an Information Circular entitled “Big Persons in Lifeboats”, which highlighted that the average weight for an offshore worker is 98kg for men and 77kg for women. The C-NLOPB has asked Operators to examine their evacuation systems in light of these findings by the HSE.

Regulators and petroleum Operators around the world are seeking optimal solutions that balance risks with adequate evacuation capacity. Regulators and Operators must find a solution that balances the risk of decreased evacuation capacity with the need to maintain safety critical systems on these installations. There is not a straightforward solution to the problem presented by this development.

Although reducing the number of persons on board (POB) would achieve compliance with the existing regulations, it would also increase other risks. Decreasing the POB would reduce the capacity to perform necessary maintenance, including maintenance of safety critical systems on the installation. This increased risk would offset the risk reduction achieved by decreasing the POB. The deferred maintenance risk could be offset by more frequent production shutdowns when all of the reduced POB could be directed to maintenance. However, there are risks associated with plant shutdowns and start-up, and these risks would be increased by more frequent shutdowns and start-ups.

Regulatory Provisions

The Installation Regulations require that every manned installation be provided with: “two or more totally enclosed survival craft that have a combined carrying capacity of at least 200 per cent of the total number of persons on board the installation at any one time.” These craft must be positioned so that half are close to the accommodation areas and the other half are appropriately located on the other side of the installation, taking into consideration the shape of the installation and the type of associated facilities. This requirement originated from the Ocean Ranger Inquiry recommendations which focused on floating drilling units, and it ensures sufficient capacity for all personnel to evacuate from either side in the event the drilling unit develops a list. These are prescriptive standards.

The concept of a performance or goal based approach to escape, evacuation and rescue was envisioned in the report by the Royal Commission on the Ocean Ranger Marine Disaster, 1985 recommendations 81 and 107. In that regard, an Atlantic Canada Offshore Petroleum Industry Escape, Evacuation and Rescue Guide was prepared as a joint effort among offshore industry Operators, drilling contractors and regulatory authorities. The Guide is intended to assist

Operators with respect to escape, evacuation and rescue (EER) by establishing broad performance goals. The principle objective of this Guide is to describe both the approach and important considerations to be used in determining the escape, evacuation and rescue measures to be implemented on an offshore installation. These measures contribute to the safety of all personnel in the event of an emergency situation.

The Guide states that Operators must ensure that all personnel have access to an evacuation system; are able to embark and be launched safely, clear the installation and survive until rescued; and have a reasonable expectation of avoiding harm during the evacuation process. The Operator must ensure sufficient capacity to evacuate all personnel, including injured personnel, on the installation at any given time. The capacities and arrangements of the evacuation system are assessed against the risk assessment. The distribution and redundancy of lifeboats and liferafts should account for the nature and location of the initiating hazard and vulnerability to impairment of the evacuation system.

The *Atlantic Accord Implementation Acts* authorize the Chief Safety Officer (CSO) of the Board to modify a regulatory requirement in certain circumstances. Specifically, the CSO may modify a regulatory requirement where the CSO is satisfied that the modification will provide a level of safety equivalent to that provided by the original regulatory requirement. The CSO may also grant an exemption from a regulatory requirement if he is satisfied with the level of safety that will be achieved by an alternate approach.

Lifeboats on the Hibernia Platform

The Hibernia platform has eight 72-person totally enclosed motor propelled survival craft (TEMPSC) or lifeboats. Six lifeboats are on the south side adjacent to the accommodations and two lifeboats are on the north side, which is the process end. This 72-person capacity was based on an average weight of 75 kg per person as per the SOLAS requirements in place at the time the Hibernia platform was designed and built. This provided lifeboat places for 200% of the normal platform complement of 280 personnel.

The Escape, Evacuation and Rescue Study, completed during the design of the Hibernia Installation, demonstrated that placing the six of the eight lifeboats required by the regulations on the south side of the platform, adjacent to the accommodation, achieved maximum risk reduction. The Certifying Authority concurred with this conclusion and the CSO approved deviation from the regulatory requirement. The stability issues on a gravity-based structure are negligible and the only credible cause for evacuation is a process or drilling event. Therefore, it would not be logical to place 100% lifeboat capacity at the north (process) side as the initiating event would preclude access for the vast majority of personnel. Further, this approach provides the greatest separation from process and drilling hazards, especially considering the large intervening accommodations structure. Since the start of operations on the Hibernia Installation the emergency procedures have assigned personnel to five of the six lifeboats on south end.

To mitigate hazards related to the possibility of launching into the wind and waves, the Hibernia lifeboats are cantilevered away from the base of the installation and are assisted by the Preferred

Orientation and Displacement (PROD) system. If a process or drilling event traps personnel on the north side of the installation, two PROD assisted lifeboats are located on that side.

Request for Regulatory Exemption (Regulatory Query)

A survey of the personnel typically traveling to the Hibernia platform found the average weight, including the weight of the survival suit and ancillary equipment, to be 100 kg. The lifeboat manufacturer recommends that the maximum carrying capacity per boat taking into account the revised average weight per person is 57 persons which has been the practice on the platform as personnel were always assigned to five lifeboats, leaving one spare. HMDC have revised the lifeboat carrying capacity in line with the manufacturer's recommendations, but have requested a regulatory exemption from the C-NLOPB to keep the total Persons on Board (POB) at 280.

Given the Hibernia platform's configuration and layout the approach proposed by HMDC meets all of the international standards reviewed by the C-NLOPB. HMDC will be able to evacuate all personnel from the south lifeboat station, plus have one spare lifeboat at that station. The spare lifeboat will be available for the remote possibility that a lifeboat is unavailable when needed. As well, there is a spare lifeboat on the north side, allowing all the personnel working in the process area to evacuate from that station in one boat. The probability of a design process event or a catastrophic well control event affecting the access to, or performance of, the lifeboats on the south side of the installation is negligible. In addition, the probability that a lack of structural stability will effect evacuation system functioning is also negligible. Consequently, the major factors affecting function of the evacuation systems are maintenance and environmental conditions. With regard to the latter Hibernia utilizes extended lifeboat platforms and the lifeboats have PROD assist. The only remaining factor is lifeboat maintenance and the proposal accounts for this factor by requiring one spare boat at all times, i.e. keeping the number of personnel on the installation such that there is always one spare boat on the south side. Any additional lifeboat capacity would have to be added to the existing cantilevered lifeboat platforms. There is a great deal of uncertainty and some risk associated with retrofitting additional lifeboat capacity to these platforms and, the minimal benefit that may be gained does not warrant the additional risk required to achieve that gain.

As part of this process, the C-NLOPB asked the Operator to consult with the Joint Occupational Health and Safety Committee. The committee had questions which were answered by the Operator.

After review, analysis and consultation, the CSO believes that the ability to evacuate all personnel onboard by means of the lifeboats at the south lifeboat station, while maintaining one spare lifeboat on the south lifeboat station and two lifeboats on the north lifeboat station meets the intent of the prescriptive requirement of 200% capacity. The Certifying Authority concurs with this view. The CSO has therefore approved the Operator's proposal subject to the following conditions:

1. Reassess lifeboat inspection, testing and maintenance procedures and practices to ensure that the risk of a boat being unavailable when needed is minimized and submit a report no later than December 15, 2011.

2. Submit a revised Safety Plan with all relevant risk assessment documentation no later than December 15, 2011.

In reviewing the Operator's regulatory query, the C-NLOPB consulted the following documents;

NORSOK Standard S-001 Technical Safety, Edition 4. February 2008:

"The minimum number of free-fall/lifeboats in the main evacuation area available during dimensional accidental events shall correspond to the maximum number of personnel (100 %) on board plus one additional boat to compensate for unavailability."

EN ISO 13702:1999, Petroleum and natural gas industries- Control and mitigation of fires and explosions on offshore production installations - Requirements and guidelines, Annex B.12.6:

"Where provided, TEMPSC should be readily accessible from the main TR and have a total capacity of at least the maximum personnel on board. The EER analysis may identify the need for additional TEMPSC so that the minimum capacity can be successfully reached and used for evacuation considering all credible scenarios and conditions."

EN ISO 15544:2000(E), Petroleum and natural gas industries - Offshore production installations - Requirements and guidelines for emergency response, Section 11.2:

"The need for redundancy in the escape, refuge, evacuation and rescue arrangements shall be considered to allow for personnel or facilities and equipment becoming unavailable in an incident."

UK Statutory Instrument 1995 No.7 43. The Offshore Installations (Prevention of Fire and explosion, and Emergency Response) Regulations 1995, Regulation 15:

"the duty holder shall ensure that such arrangements are made ... as will ensure, so far as is reasonably practicable, the safe evacuation of all persons .."

The Approved code of practice and guidance - to this regulation suggests that 'there should be sufficient TEMPSC places for 150% of the persons on board, unless an alternative standard is justified."

The Atlantic Canada Offshore Petroleum Industry Escape, Evacuation and Rescue Guide (EER Guide), which has been ratified by the C-NLOPB, CNSOPB and CAPP. The applicable requirements EER Guide are in section 8.2, which deals with semi-dry evacuation (lifeboat and life raft) capacity and access. The expectations and guidance are as follows:

"8.2 Expectations: Evacuation Capacity and Access

The operator shall ensure that the means of semi-dry evacuation are of sufficient capacity to evacuate all personnel, including injured personnel, on the installation at any given time.

The capacities and arrangements of the semi-dry means of evacuation should be determined and justified on the basis of an assessment of the credible hazard scenarios and distributions of personnel during operations, including peak manning operations.

Guidance: Evacuation Capacity

The distribution and redundancy of means of evacuation should account for the nature and location of the initiating hazard and vulnerability to impairment. Lifeboats are typically arranged adjacent to temporary refuges, in a location relatively well protected from such hazards as blast and fire. The vulnerability of the means of evacuation to various major hazards should be considered and appropriate measures taken to ensure adequate survivability and availability, including through redundancy.

Further, the means of evacuation should be accessible from a temporary refuge or muster station via a safe route.”

July 29, 2011