FIELD TRIALS OF AN INSTRUMENTED LIFEBOAT IN ICE CONDITIONS

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ABSTRACT

Emerging hazards on a ship or offshore petroleum installation can lead to an evacuation scenario. The means of independent evacuation on board must be capable of operating in the conditions that prevail at the time of the emergency. It is essential to know what to expect of evacuation systems in terms of their utility in the range of weather conditions that can reasonably be expected in a given operating region, including the presence of sea ice. It is equally important to account for the interaction of the evacuation systems and the people who have to use them.

KEY WORDS: evacuation, emergency, offshore, ice, safety, lifeboat, field trials

INTRODUCTION

This paper presents the results of field trials that investigated the performance capabilities of a small conventional lifeboat, or totally enclosed motor-propelled survival craft (TEMPSC), in natural ice conditions. The field trials were conducted in May 2007 off the north coast of Newfoundland. Ice conditions in which tests were conducted included thin level intact ice and broken pack ice. As the tests were done in spring, the first year ice was in the process of melting and was not as hard as might be expected in mid winter. Additional tests were done in heavy broken pack and rubble that was partly made up of the remnants of deteriorating icebergs. The trials were done with a manned 20-person lifeboat over a four-day period. This was the first of a series of field trials planned for the next three years with evacuation systems in ice.

We begin the paper with a brief account of the field trials, including a description of the lifeboat, instrumentation, trials site, and test plan. As space limitations prohibit a full presentation of the trials data, examples of measured results are shown to illustrate the scope of the first phase of the field program. Measured results from the trials are compared to model scale experiments done previously in an ice tank at the Institute for Ocean Technology (IOT). In addition, observations concerning human factors issues that were identified as being worth examining further in subsequent trials are reported.

FIELD TRIALS

The field trials reported here represent the first year of a three-year field campaign. A key objective of these preliminary trials was to assess the performance of the lifeboat in open water, pack and level ice, as well as work out logistical and operational requirements in advance of the remaining campaign. The trials program encompassed a day for setting up the instrumentation on site, a day for open water trials, plus two days of ice testing: one in pack ice and one in level ice. The last day was used to decommission the lifeboat. In addition to the instrumented lifeboat, there was an accompanying fast rescue boat in attendance at all times, as well as a support vessel. The support vessel was a local fishing boat chartered for the trials.

Site

The trials were done off the North East coast of Newfoundland, in the vicinity of Triton and Pilley’s Island, during the first four days of May, 2007. The site was chosen due to the local ice conditions in the region, and well as the excellent logistical support available. Open water trials took place at 49°30’12.85”N, 55°43’39.68”W. Pack ice trials were conducted some 2.25 Nm miles away in the bay between Triton Shipyard and Pilley’s Island harbour near 49°27’52.38”N, 55°44’6.97”W. Tests in level ice were done 2.5 Nm away in an inlet near Pilley’s Island at 49°29’46.70”N, 55°41’8.17”W.

Lifeboat

The lifeboat, or Totally Enclosed Motor Propelled Survival Craft (TEMPSC), is of glass-reinforced plastic construction with the hull, inner-hull, and canopy moulded individually with poly urethane foam as the buoyant material. It was built to the requirements prescribed by the Safety of Life at Sea (SOLAS) Convention (IMO 1997) and the International Lifesaving Appliance (LSA) Code (IMO 2003). In addition, tests were done according to corresponding guidance from the International Maritime Organization (IMO 1998).

The TEMPSC is 5.28m long, 2.20m wide, 2.70m high and has a moulded depth to the gunwale of 1.10m. This size facilitates storage and transportation to the trials location in a standard cargo container, or on its own trailer. The TEMPSC is equipped with a 29 HP engine, an electric starting system, conventional propeller inside a steerable nozzle, gear shift/throttle control, wheel, magnetic compass, on/off power switches and a 24V battery, as well as safety equipment (e.g., painter, oars, sea anchor, bailer).

Prior to outfitting, the unloaded lifeboat weighed 2160 kg. It was loaded to its full complement, corresponding to 20 (75kg) people. The