IMPROVING FREE-FALL LIFEBOAT SAFETY

TNO innovation for life

Offshore drilling and oil production are dangerous lines of work. That is why onboard safety regulations and safety measures are among the strictest in the world. One of these safety measures is sufficient lifeboat capacity. Offshore lifeboats are often free-fall lifeboats.
In case of an emergency these are dropped from fifteen to over thirty metres above sealevel.
TNO was asked by the Norwegian Oil Industry Association (OLF) to evaluate the safety procedures and found that they were not as safe as they should be. So we set about to improve free-fall lifeboat safety.

WIDE EXPERTISE IN CRASH TESTING

TNO has been active in the automotive and maritime industries for decades, covering a wide range of fields, including crash testing, structural reliability, safety, modelling & simulation and human factors. When the Norwegian oil company Statoil asked us to evaluate the safety of its free-fall lifeboats, our initial tests indicated that onboard occupant safety was not guaranteed. Our scenarios showed, for instance, that when under specific circumstances the lifeboat was dropped from as much as thirty metres in a rough sea, the risk of injury for the occupants could increase dramatically compared to exercise drop scenarios in calm water. It also turned out that occupant safety requirements for these lifeboats were much less strict than the requirements for car occupants and that the offshore procedures could benefit from methods used in the automotive industry, if correctly applied. The outcome of our tests led to a collaboration between Statoil, the Norwegian Oil Industry Association (OLF), the Norwegian Marine Technology Institute MARINTEK and TNO. In this collaboration the scope was extended to davit-launched lifeboats, which have their own specific occupant injury risks. Our ambition: to improve free-fall lifeboat safety.

10,000 DIFFERENT SCENARIOS

To obtain a reliable picture of the actual safety of free-fall lifeboats nearly the entire current lifeboat fleet under OLF's control was run through 10,000 scenarios at the TNO facilities. The scenarios were all based on full-scale tests, crash tests involving dummies with hypersensitive sensors and validated simulations, allowing us to measure the effects on a human body inside a free-fall lifeboat that is dropped from a rig. The scenarios also covered the full range of influencing

factors, including drop and wave height, sea conditions, occupant size and weight, acceleration and angle of impact. The outcome of the tests published by TNO has already led to many changes in the design of free-fall lifeboats. The Norwegian classification body Det Norske Veritas adopted our occupant safety evaluation method as the new interim standard for free-fall lifeboat design, and the first results can now be seen in the improved new lifeboats that are entering the market today.

WHAT TNO CAN DO FOR YOU

At TNO – an independent research organisation – over 4,000 experts work daily to support thousands of customers worldwide in domains ranging from Defence and Public Safety to Automotive, from IT to Human Factors. Based on deep knowledge and expertise built up in decades of projects for Navies and offshore companies worldwide, TNO helps the maritime industry to develop and apply innovative products, use sustainable resources and optimise processes and production chains.

Installation for free-fall lifeboats

Courtesy of StatOil

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