

# Safe and sound

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For centuries the Dutch are fighting sea and rivers to make their country safer. Worldwide, countries approach the Netherlands for advice in the area of dredging. But this is not the only area we are active in to increase the safety in the maritime industry. Maritime by Holland Magazine takes a closer look at three projects in which Dutch companies are involved, that were designed to enhance safety.

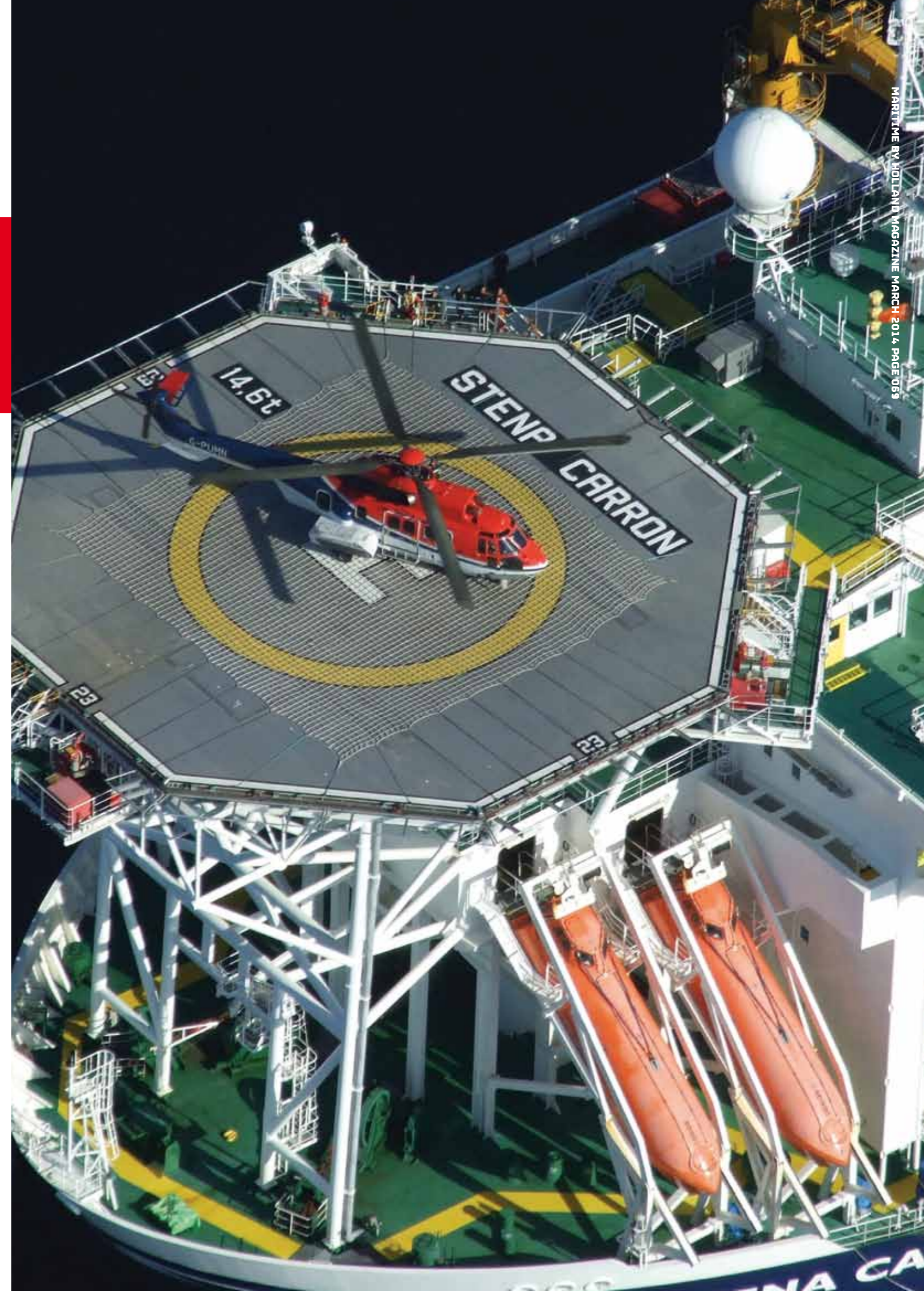
In 2006 the Norwegian company Statoil contacted research partner TNO to investigate the safety of all freefall lifeboats on the Norwegian continental shelf in a joint industry project initiated by the Norwegian Oil Industry Association. The findings caused Det Norske Veritas to develop the DNV-OS-E406, a new standard which forms an addition to the SOLAS-standard for freefall lifeboats on platforms. In this new offshore standard requirements for freefall lifeboats are enhanced, which improves the safety of the lifeboat occupants. The Petroleum Safety Authority decided that from 2015 all Norwegian freefall lifeboats at platforms must meet these demands.

## Occupant safety

One of the suppliers for freefall lifeboats in Norway is the Dutch Verhoef Access Technology whose experience with aluminium vessels goes back to 1939. Martin Verhoef, vice president, says: "In 1960 the first freefall lifeboat in the world, designed by my father, was installed on a Dutch coaster. It was made of aluminium alloys, because of the well-known mechanical properties: light, strong and a long duration of life. Same qualities are still very valuable for the design and construction of freefall lifeboats, which are built today."

Verhoef consulted several times during the development of the new DNV-standard and is now applying the new requirements to their lifeboats. The DNV-standard has three main topics, which are structural safety, positive headway and human safety. For example, research has shown that the average weight of a worker on an offshore platform is 98 kilogrammes, the SOLAS-standard specifies that the seats of the lifeboats must be able to carry a person of 82.5 kilogrammes, and DNV has pushed this number up to 100 kilogrammes with a maximum up to 150 kilogrammes. The same goes for height requirements for persons, which now ranges from 1.50 metres to 2.10 metres tall. In order to meet these demands Verhoef designed aluminium seats for their FL50-NS with a sliding headrest, onto which the newly developed five-point harness is attached. This way the seat can always be adjusted to the passenger, guaranteeing maximum safety during the launch.

In order to test Verhoef's new seat design they contacted TNO. "TNO is the only place in the world where you can test this kind of seats and, next to this, you are associated with a world-renowned research institute. We first conducted tests at MARIN, then Norwegian





## "Creating awareness on the Dutch waterways"

research institute Marintek performed computer simulations of freefall lifeboat drops, from which representative boat accelerations were computed. TNO used this data for their own tests on our seats. They were tested with dummies with a weight up to 150 kilogrammes. Based on this, TNO developed a computer model that can simulate a set of situations and created an occupant safety analysis, from which we can extract information to use to enhance the seats. The DNV-standard is a step forward to improving the occupants' safety. We, as one of the leading suppliers, need to take this opportunity and consider it a challenge to improve safety of lifeboats even further." After the introduction of the DNV standard Verhoef has decided to manufacture only freefall lifeboats in line with these requirements, which matches with their company policy to deliver only the safest lifeboats. "All the boats that will be delivered from 2014 on meet these new demands, including a drop test for each free fall lifeboat from their installation height prior to delivery", Verhoef concludes.



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### Creating awareness

On the Dutch waterways, the Safe Boating.eu (in Dutch: Varen Doe Je Samen!) project takes place. In 2007 Rijkswaterstaat South-Holland noticed an increase in unsafe situations and accidents on their waterways and started a pilot to improve safety by increasing

awareness among the waterway users through education. Hylke Steensma, project leader at Dutch Recreational Waterways (in Dutch: Stichting Recreatietoervaart Nederland), tells what happened next: "The pilot was such a success that it swept the nation in 2008. Now Rijkswaterstaat, the Dutch provinces, several port authorities and branch organisations are working together in the joint industry project that will be completed at the end of 2014. First, we saw recreational users without any knowledge and preparation go boating, which sometimes had severe consequences. Although it is hard to measure the results, we do think that there is an increased awareness. The personnel on the traffic posts of Rijkswaterstaat noticed that people navigate better, are more aware and are better prepared."

He continues: "Our goal is to increase the safety at crossings, where commercial vessels and recreational boaters cross each other, by providing the required knowledge in an accessible way through information and education. We have published ten booklets, in which the most important crossings are described and advice is given how to pass by these locations safely. The booklets and other brochures are free of charge and can be downloaded from our website. We also organise clinics for the recreational boater in which we pass crossings, and teach them how to handle the situation. When things do go wrong, the wounded always appears to be the recreational boater: when a commercial vessel hits a yacht it is like a truck runs over a bike rider. Commercial skippers already have the knowledge; they must lead by example, so it



"Boaters can have problems in a lock when being flushed by a commercial vessel." Photo by Hylke Steensma

is also important to have them involved in the project. We often hear stories of boaters that have problems in a lock, when being flushed by a commercial vessel with its propeller in use. Be patient is what we want to tell them."

In 2014 the current cooperation ends. Steensma: "This does not mean the project is finished though, we still have to keep informing the recreational users on the waterways as well as the commercial skippers. In several meetings we find points for improvement, which can be taken into account in a follow-up project. For example, the commercial shipping industry and the leisure industry can be divided in different branches, or perhaps the container shipping, liquid bulk shipping and so forth. Furthermore, our results are difficult to measure. Like I said, people see the improvements but we do not have many numbers and figures to show. We want to see if we can connect the different parties that collect numbers and develop a better registration system. And due to the success of the project, a European Safe Boating project is launched in which navigational safety for all users of the European waterways is promoted."

### Safe helicopter operations offshore

The HELIOS Joint Industry Project (JIP), conducted by MARIN and the National Aerospace Laboratory of the Netherlands (NLR) in cooperation with TU Eindhoven and a range of stake holders, focuses on safety and availability of helicopters for offshore vessels. Henk van den Boom, manager of the JIP, explains: "More and more compact vessels are used offshore, working twelve months a year even in harsh weather areas, while relying on helicopters for crew changes and supplies. The current offshore helicopter regime has strict limits to the allowable heave, roll and pitch

motions of the helideck, which leads to a poor workability, while the regime is not necessarily safe as critical factors such as side wind are not considered. We examined ways to increase both safety and workability. The first phase of the project which was supported by the UK Civil Aviation Authority and by companies such as Petrobras, Amarcos and AgustaWestland, resulted in a solid plan for future developments both in regulations and innovations."

Van den Boom continues: "The current workability of helicopters on offshore vessels in harsh weather is unacceptably low, sometimes less than 30 per cent of the time, while the current limits lack a rational basis: the stability of the helicopter is assumed to be dominated by heel and pitch angles, the extreme motions for

the coming 20 minutes are assumed to be equal to those of the last 20 minutes and wind is not even in the equation. This situation offers room for improvement."

For this purpose five technologies, proven technologies from other sectors, have been selected, which will be tested in the second phase of HELIOS. For example NATO navy helicopters are fitted for decades with a deck-lock system, which secures the helicopter to strong grid on the helideck and prevent them from tripping. Offshore helicopters have not used this system so far. Another innovation which can be implemented, is a computer prediction, developed and tested by MARIN, of the extreme helideck motions in the coming 20 minutes based on the history of the vessel motions. "The business case we made for the implementation of all five technologies on three 100 metre long offshore support vessels and the servicing helicopters in Norway, showed that the return period on investment was six months", Van den Boom adds.

These innovations can be accepted and implemented under the present landing limits provided that the vessels and helicopters equipped with these technologies can step up to a better class within the current regime. In the meantime work will continue on new guidelines and regulations based on the actual physics of the helicopter stability taking into account accelerations and wind and allowing for the new technologies. The second phase of HELIOS is aiming at both the testing and demonstration of the technology innovations and the implementation of the new helicopter stability model in the coming years.

Anne Kregting

Freefall lifeboats positioned at a platform



Testing helideck motions

