First in Freefall

Report interviews the first and only aluminium Freefall lifeboat builder in the world and outlines how MARIN helped validate its latest lifeboats.

Martin Verhoef

Established 75 years ago, Verhoef Aluminium is a truly unique company being the one builder of aluminium Freefall lifeboats in the world.

This family-owned Dutch company was founded by Joost Verhoef and today is run by his two sons Martin and Joop, together with vice commercial director Ruud Schwegler. Although Verhoef now has a global presence from Alaska to New Zealand, being active in 70 countries, and has many global companies amongst its clients such as Maersk Oil & Gas, Shell and Statoil to name a few, its pioneering Freefall lifeboat concept took a while to take off.

These days the company builds a complete range of lifeboats from the smallest ones for 6-12 people of 8.5 m to those for 50-70 people of 16 m. They all have seats designed for people weighing 100 kg, which is well above the SOLAS requirement of 82.5 kg. Verhoef also fabricates its own launching cradles and recovery systems and provide all the hydraulic/electrics required. The lifeboat launching recovery system is all in one unit, which is also unique in the industry.

Martin Verhoef, Chief Executive Officer, reflects on the development of this life saving technology. After many years building open aluminium lifeboats – in fact more than 5,000 – his father came up with the idea of launching a totally closed, self-righting Freefall lifeboat in the early sixties. This was in contrast to the traditional method of lowering an open lifeboat by a davit system. The Freefall lifeboat idea however, was unfortunately far ahead of its time, he says. There was no legislation in place to support such a concept and the industry was fairly sceptical in the early days.

Self-righting Business continued with its traditional lifeboats for many decades and its other major core activity building gangways and access systems, 650 of which have been delivered worldwide. The totally closed, Freefall boat though did however, spark some interest in Russia, which embraced the idea recognising that totally closed lifeboats were a considerable advantage in sub-zero temperatures to saving lives. However, the Russians also felt it was too early for the Freefall concept.

Several decades on in the eighties there was a significant shift in the industry's attitude following two major maritime accidents in Norway where there was a considerable loss of life. The Norwegians started to revaluate lifeboats and they turned their attention to the one and only aluminium Freefall boat builder in the world, Verhoef. Originally, the Norwegian Forskning Institute and Maritime Research Department came to the company's headquarters in Aalsmeer, outside of Amsterdam, and asked if they could buy the Freefall design from Verhoef.

Joost Verhoef flatly refused. But much to their shock, he said he wouldn't let them buy it, but they could have it for free. Martin explains that at that time his father believed that he couldn't make the necessary investment to develop the concept further but more importantly, from a humanitarian view, he simply did not want to see the design filed in a cabinet when it could be used in the maritime industry to save lives.

Saving lives The Norwegians were only too happy to develop the design and they pressed on but with one big difference – they would build it in fibreglass. Meanwhile, Verhoef was involved keeping up-to-date with how things progressed. Years on, there was another key event, whereby the industry started to take a fresh look at traditional lifeboats lowered by davits and that was the Piper Alpha North Sea oil production disaster in 1988. From then on demand for the Freefall lifeboat gradually grew.

Typically, Verhoef now builds up to 25 vessels a year, all of which are built in the Netherlands and exported all over the world to the major oil companies.

Martin is keen to point out that a vessel built in 1991 for Petrofac Training Institute achieved an important milestone when it was dropped for the 5000th time. This vessel highlights the durability of the aluminium-built lifeboat, he stresses, and even though it has had a hard life it still looks virtually new. The Petrofac lifeboat is back at Verhoef, and proudly shown to visitors and was exhibited at MARIN's last Open Day.

"Aluminium is very, very strong, light – facilitating speed – and extremely durable. Many of our lifeboats are still going strong 25 years on and they could last for many more years. Their duration is enormous. Aluminium is simply the only material suited for dropping freefall, rather than lowering by wires."

Tremendous durability More recently, another significant event in lifeboat design would make the offshore industry consider the advantages of the aluminium Freefall vessel.

In 2005, commissioning tests were being carried out on a fibreglass boat when it suffered a major 20cm collapse of the canopy. The Norwegian Petroleum Safety Authority felt the matter should be investigated thoroughly. It was later discovered that the deflection was the result of the poor quality of the vessel and having no cross frames. However, it was clear that there should be specific legislation for Freefall lifeboat design and testing procedures. This then led the classification society DNV to investigate the matter, focusing on structural safety, human safety and the ability of the vessel to make positive headway.

This test failure also led Statoil to examine its requirements for the future and it turned to Verhoef, which ultimately resulted in the company's first ever Framework Agreement. The contract is initially for five years and with the possibility of two, three-year extensions. Statoil wanted a good lifeboat design following DNV's recommendations but they insisted any new design had to meet stringent requirements and be thoroughly tested and everything fully documented. Any research and testing procedures could only be carried out by companies approved by Statoil.

Statoil Framework Agreement And MARIN was one such approved company. "Statoil wanted companies it could trust to do the tests, reliable companies that could answer all the questions. MARIN has helped us document and completely validate the Freefall lifeboat and assisted us obtain the necessary DNV Statement of Compliance."

Initially, MARIN carried out model tests at Verhoef's own test basin 'Wind-bad'. At the basin, which is on site, it is possible to generate wind of up to 32m per second (wind force 12). In addition, model tests in waves were carried out by MARIN. Statoil also attended all of the model and full-scale tests so the MARIN team, Verhoef and Statoil worked very closely together. "Business all comes down to trust. If there is no trust, you cannot do any business. Statoil wanted companies it could trust and we did too."

The model tests were followed by full-scale tests. Drop tests took place in the port of Amsterdam where Verhoef has its own dedicated test-tower. MARIN's measuring equipment was placed inside the lifeboats and drop tests were carried out at various heights from 32 m to a staggering 40 m with human dummies inside the vessel.

State-of-the-art equipment enabled MARIN to examine the acceleration forces as well as how the vessel performed in terms of being able to make positive headway. "This was incredible, we could measure the G-forces upon entry in the water and the headway metre by metre." The tests resulted in impressive results, where the lifeboat was 55 m away in 5 seconds, 130 m away in 20 seconds and 195 m away in 45 seconds – and all without propulsion.

MARIN's measurements – simultaneously measuring G-forces, distance and time – are the first time this has been done and this impressed the oil industry, he emphasises.

Martin comments: "MARIN has allowed this excellent performance to be properly documented. Having these measurements completely validates our boats and enables us to obtain all the proper certification."

Like his father before him, Martin stresses that ultimately it is all about safety. "This is really the best development ever for human safety at sea – to get safely away from a ship or platform in 195 m in 45 seconds – without depending on the safety of winches and wires."

The company's contribution to saving lives has been recognised by one of the highest honours in the Netherlands, when it was awarded the Gold de Ruyter Medal, which is awarded from the Dutch government and by Royal Decree.