MARIN's relationship with Royal Netherlands Navy goes from strength to strength

A partnership based on trust

MARIN's relationship with the Royal Netherlands Navy and the Defence Materiel Organisation (DMO) is one that spans decades and it is one that looks set to intensify in the future. Report interviews Jaap Huisman, head of DMO's design office about the partnership.

Mr Huisman personally, has also had a long relationship with MARIN because he briefly worked there back in 1974 whilst studying to become a naval architect at Delft University. Over the years he has been a regular visitor to MARIN's Wageningen headquarters.

From the New Year Mr Huisman expects to again be working closely with MARIN as he takes on a new role as head of platform systems, which includes hydrodynamics.

Mr Huisman is very keen to stress that the navy unit of the DMO is not typical of similar organisations in other countries because it is not just about procurement. The DMO has its own design offices, he says. "We still design our own concepts for ships, they go for tests at MARIN and then they are engineered and built by Dutch yards."

It is therefore essential to keep naval design expertise available in the Netherlands within industry, defence organisations and especially at knowledge centres like MARIN, he says. "The real specific in-depth, hydrodynamic expertise lies with organisations such as MARIN. We are actually brokers of that knowledge."

One advantage of working with MARIN is that the DMO can give feedback from the naval fleet so that both the MARIN and DMO

naval architects can work together. There are many synergies between MARIN and the navy, he adds.

Currently, the two organisations are working on several surface ship and submarine projects. Eelco Harmsen, the point of contact between the DMO and MARIN for surface ships, says that essentially the combination provides a knowledge centre, a centre of excellence in the Netherlands.

Due to the fact that the DMO can provide feedback for MARIN from full-scale trials this also helps further development. Dutch frigates for instance, are perhaps the quietest in the world, he points out, especially from the propeller point of view.

Propulsive research At the moment several navies are working on R&D for advanced propulsion designs for surface combatants, particularly focusing on cavitation and propeller noise during combat operations. "Now we are trying to find a more tolerant design when the sea conditions are changing, taking into account ships' motions and dynamics."

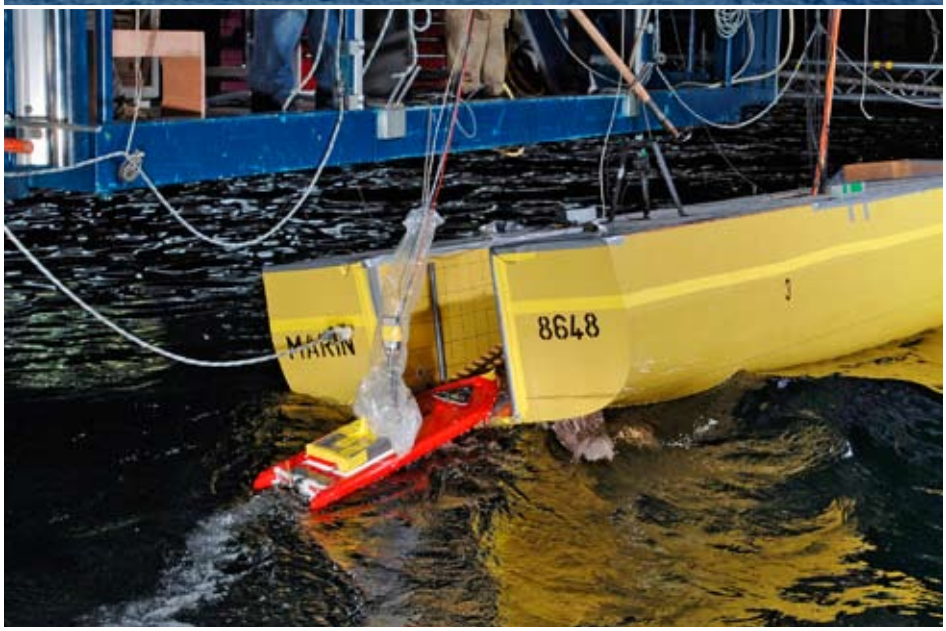
MARIN and DMO started on the propulsive research years ago, looking at different combinations – conventional shafts, pods and waterjets. The research is currently focusing on waterjets and understanding the physics. "This involves looking at it in a completely new way and this is new for MARIN as well," he says. "It is a learning curve for both of us." A combination of model testing and CFD calculations are being used and the navy and MARIN are exploring the benefits of CFD calculations in the initial design process. Research is expected to take at least another six years.

The DMO stresses that it is important for MARIN to have both a knowledgeable and critical client. It can then give MARIN feedback as soon as possible when testing is underway, especially with seakeeping trials. This means the validation process is speeded up and it is possible to see which seakeeping and manoeuvring criteria affect the mission.

Submarines Another important area where the two organisations team-up concerns submarine technology. Pieter van Coevorden, who heads up projects for subsea technology, says currently they are addressing the changing operational profile of the submarine. "Submarines were designed for open oceans but they are now being deployed close to the shore."

Model testing is being carried out at MARIN for submarines that travel near to the seabed and examining how this close proximity affects the manoeuvring characteristics. The end-goal is to develop a simulation code that could formulate predictions which could then be used by submariners to give them operational guidance. Here, the navy provides guidance from its submarine service so the feedback can steer the research.

LCF frigate on the sound range



RHIB deployment test for patrol vessel

Mr van Coevorden also stresses that it is vital to keep the knowledge gained from the navy and MARIN in the Netherlands for the future. The research helps fill the knowledge gaps because obviously, ships are not ordered every day so this testing keeps them up to date with the very latest technologies. New CFD tools are being developed and combined with the testing results.

Several navies and MARIN are also working together in the submarine sector. Recently, a Free Running Model has been developed and this has been tested at MARIN. Only a few organisations in Europe have the facilities for testing such a model and MARIN is one of them.

CRNavies Another area where both the Dutch navy and MARIN work together is Cooperative Research Navies. "This is a very important international community and helps to build up hydrodynamic knowledge and it helps us to understand the stability of damaged ships for instance."

MARIN has been involved in the development of four patrol ships that are being built at Damen Schelde Naval Shipbuilding. The first keel-laying just took place and the vessels will be delivered between 2010-2012. MARIN helped with the design of the slipway for the high-speed interceptors and hull form, the final design and the speed trials were conducted at MARIN. A Joint Support Ship is also being developed. Here, MARIN has assisted with the hull form and propeller design.

In the future, Mr Huisman is certain that MARIN and the DMO will work together even more intensively. "After 2015 the fact that the world is warming up will be an important factor. As the ice melts and the hunt for oil starts to get underway in unexplored areas, specific design requirements will be challenged. One area of interest concerns unmanned vessels operating below the surface."

The DMO is particularly interested in MARIN's recent integration of the Qnowledge team, a producer of advanced design tools. Qnowledge has developed an integrated design tool that can generate and analyse ship concepts and compare them very quickly.

MARIN is of course, very well known for model testing but Mr Huisman would also hope that MARIN could even take on more design office functions and become "more of a partner in design in the future".

The DMO underlines that the crucial thing about the relationship is that it is based on trust. "We trust MARIN," says Mr Huisman. There is very good interaction, very short lines of communication and people know each other personally. Ideas can quickly get into the water."