

This year and in future, MARIN's relationship with the offshore sector will be substantially strengthened with the opening in June of its new purpose-built Deepwater Offshore Basin. JOHAN WICHERS, vice president offshore USA, reviews the most advanced and deepest offshore test facility the world has ever seen.

MARIN's new Offshore Basin is 'unique', without global parallel

Wichers recalls: "In the past the large part of offshore activities was done in our wave and current basin, built in 1965. Our depth capability was a maximum of one metre, and we could make a simulation of 60 by 40 by 1 metres generating waves and currents." In fact, MARIN's early facilities were involved in

some 70% of all tank tests conducted at that time, with heavy emphasis on floating production systems. But in time, the offshore market began to evolve to deeper waters. MARIN responded to its needs by working with the then new Norwegian offshore test tank facility in Trondheim. Wichers: "The first truly deepwater projects for SBM and Sofec of Houston sought out our expertise despite the fact that we didn't have a capability of our own: they hired us to go to the new Norwegian deepwater facility. We were happy to be asked, but this was a big impetus to us: we had to change, and we had to make our own plans for the future."

Industry driven

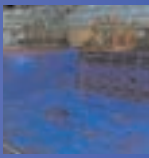
A period of study and research ensued. An initial plan to re-develop the existing wave and current basin to create a new deepwater basin was rejected as being far too expensive. The

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offshore in depth



concept of a separate seakeeping basin and a deep-water offshore basin was launched.

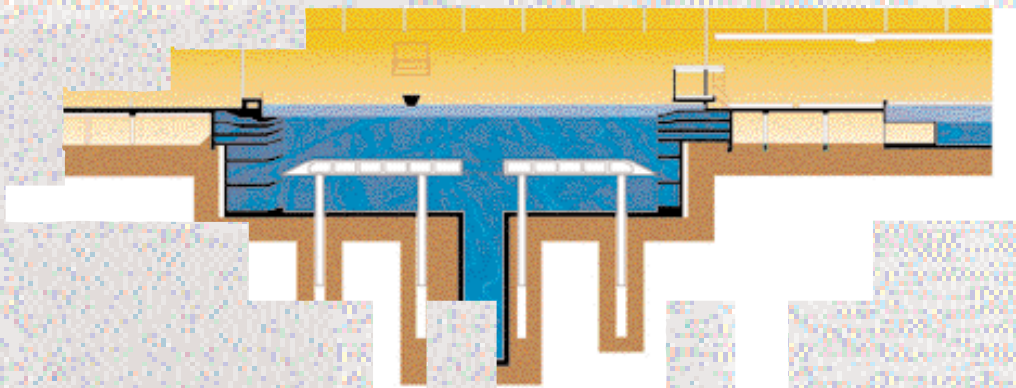
Dutch industry got firmly behind the plan: "The entire project was industry driven and this was an important factor in our eventual application to the state for \$50 million in funding." The fund was to be divided to create a new seakeeping basin, which opened a year ago, to build the world's deepest and most advanced offshore basin and to rebuild MARIN's depressurised towing tank.

The offshore basin will come into operation in June this year. With the oil price recovered, a number of deepwater projects are coming off the back burner. As Wichers says: "The timing of our opening simply could not be better."

this already in the past, and this will be the proven route ahead for the future."

The Offshore Basin is already contracted for its first project to develop a TLP with 1000 metre water depth for Unocal's Seno fields offshore Indonesia.

Wichers says reaction from the industry is extremely positive. "You may ask what is coming up: look at the Shell's Bunga project in Nigeria, an FPSO in 1000 metres of water; then there's the Exxon Mobil project offshore Angola, called Kizomba calling for a 1300 metre FPSO and an associated SPAR or TLP system connected by mid water risers. Offloading would be handled by a deepwater CALM buoy."



Cross section new Offshore Basin with its moveable floor and deep pit.

He adds: "The new tank will be able to generate waves over all kinds of angles, and this is unique. It will also be able to create currents over the full ten and a half metres; it will have a moveable floor to enable water depths precisely how clients want, up to 3,000 feet. A 5 m diameter pit will give an additional depth of 20 m; here we will be able to simulate 10,000 feet water depth. Yet in operating areas such as the Gulf of Mexico, Brazil and West Africa, operators and contractors are looking for 6,000 and 10,000 feet.

The future is here

"The accepted future is that we will test 10,000 feet FPSOs and we will do this with hybrid testing in combination with super computers. We've done

"There are several developments up and coming in the Gulf of Mexico: SPARs or FPSO systems for deep waters; the major potential problem here is one of hurricanes, with the other threat being loop or eddy currents – currents or eddies which enter the Gulf and give huge forces not just at the surface, but at great depth. Nowhere else in the world can these eddy currents be simulated.

"How will an FPSO and its risers behave in these complex currents? The only way to find the answer will be for a full tank simulation of these extremely unusual current flows using six independent current lawlers - our basin is the only one in the world which can simulate this."

MARIN