



## Protecting the environment

The Oil Search / ExxonMobil Kumul Oil Platform is located in the Gulf of Papua, 40km off the southern coast of Papua New Guinea. To extend its life and increase capacity, a \$25 million "Topside" rejuvenation project was undertaken.

During operation, any water or oil that drains from the platforms structure or from its production systems is channelled into the open drain caisson (the leg of the rig) to prevent any environmental impact on the sea around the rig. The hydrocarbons and excess water that collect in the caisson are then pumped to the closed drain accumulator for safe disposal via a "take-off" tanker.

## Caisson challenges

The caisson is angled under the water and so to pump the fluid from the caisson to the accumulator required a 13m long vertical sump pump which had to be installed within the caisson and operate at a 5 degree angle from the vertical.

To prevent the build-up of marine growth an arrangement for low pressure injection of hypochlorite was also specified.

Amarinth was approached to deliver a cost effective solution to a very tight deadline for this difficult engineering requirement which would be operated on the other side of the world.

Although a vertical sump pump was specified for the duty, the height restriction of the platform meant that a standard VS4 pump could not be installed.

The 5 degree angle of the caisson also presented further challenges as the pump had to be carefully lined up with the caisson wall and operate reliably at this angle.

## Proven experience

Using a combination of its proven API 610 VS4 pumps and the work it had done previously on platforms with restricted headroom, Amarithh designed a bespoke modular API 610 VS4 vertical sump pump that could be dismantled and installed in four sections and removed in sections for subsequent maintenance.

To ensure that the pump was perfectly aligned with the caisson wall, working closely with the customer Amarithh designed an innovative adjustable roller system on the pump that aligned with guide plates attached down the inner wall of the caisson as the pump was lowered in.

The bearings and seals were put under additional pressure due to the 5 degree angle. To guarantee the performance and reliability of the pump Amarithh built a test rig to replicate the operating conditions and mounting system to ensure that the final design took account of the additional stresses and vibrations as a result of the alignment.

## Delivered to the deadline

Drawing on the ingenuity of its engineers, Amarithh was able to deliver a very cost effective solution to PSN that met both the requirements and the tight timescales of the project.



## Wood Group PSN

Wood Group PSN was formed from the merger of Wood Group's Production Facilities business and Production Services Network (PSN).

The merger created the world's leading brownfield service provider with annual revenues of around US\$3 billion. With its headquarters in Aberdeen, UK, the company has a 23,000 strong workforce operating in more than 35 countries.

Wood Group PSN is the leading global provider of pre-operations, hook up and commissioning, operations and maintenance, engineering, construction, project management, training, and decommissioning services, primarily to the energy industry.



"Amarinth's innovative design solution delivered a unique mounting system within the platform caisson which proved invaluable for this project. Their professional approach throughout, despite the time difference, meant that the project delivery was achieved. We look forward to working with Amarithh again in the future."

**Peyman Orangi**  
Lead Mechanical Engineer