



BUMIARMADA

Largest FPSO in Indian waters

When Bumi Armada required API 610 VS4 pumps for a new FPSO vessel being built for Oil and Natural Gas Corporation (ONGC) of India, it turned to Amarith for its proven expertise in designing bespoke vertical pumps for FPSO vessels.

FPSO Armada Sterling V will be deployed at the Cluster 2 region of ONGC's KG-DWN-98/2 deep-water block, approximately 22 km off the east coast of Kakinada, India.

The new FPSO vessel will be the largest in Indian waters, measuring 321 metres in length and 60 metres in width, with a processing capacity of 60,000 of barrels per day of liquids and 3 million standard cubic metres per day of gas.

To equip the vessel, Bumi Armada ordered two 18m long pour point depressant pumps and four 10m long methanol lift pumps from Amarith, totalling \$1.5M.

Bearing temperature sensors

FPSO Armada Sterling V is designed for continuous operations up to maximum wave heights of over 27 metres and so monitoring of the pumps during operation was crucial in these challenging conditions.

The temperature of each bearing in the pumps required a separate monitor and so PT100 temperature sensors were designed and installed along the length of the pumps.

The individual sensors for each pump were terminated in a top surface junction box with the wiring then fed through a unique armoured umbilical arrangement to a control box on an independent instrument skid.

Due to the explosive atmosphere aboard a FPSO vessel, the pumps, associated wiring and instrumentation were all rated for ATEX Zone 0.

Decks built around the pumps

The pumps were manufactured in the UK and assembled in Amarith's facility in Rendlesham, UK. They were then independently witness tested and certified by DNV before being disassembled into 3m segments for shipping to the Sembcorp Marine Tuas Mega yard, in Singapore.

The assembled pumps had to be installed into the vessel as it was being constructed. The four 10m long methanol lift pumps at the bow and the two 18m long pour point depressant pumps at the stern. The deck structures would then be built around them.

To facilitate this, Amarith designed a bespoke lifting arrangement. Each pump was first assembled horizontally on the dock side and attached to a frame, and then a crane lifted the pump vertical and lowered it into the vessel.

Amarinth also designed a system of supporting brackets to attach each pump to its tank during the installation. This ensured that as the pump was lowered into the tank it remained perfectly aligned, reducing vibration and wear during operation.

A 48-hour installation window

The installation of the pumps had to fit the vessel's build schedule which meant completing it within a 48-hour window. Bumi Armada therefore contracted Amarith to oversee the installation and commissioning of the pumps.

The installation was scheduled in two phases. The first for the four bow pumps and the second for the two stern pumps. The installation of the bow pumps coincided with the worst of Covid-19 pandemic in Singapore and the Christmas period. However, Amarith's Engineering Commissioning team still managed to travel to the yard and, subject to twice daily Covid tests, successfully undertake the installation and commissioning of the four 10m bow pumps. The installation of the two 18m long stern pumps was then completed on schedule, again with assistance from Amarith, a few months later.



Bumi Armada

Bumi Armada is a Malaysia-based international offshore energy facilities and services provider with a presence in over ten countries spread across three continents, supported by over 929 people from over 27 nationalities.

Bumi Armada delivers Floating Production Storage Offloading, Liquefied Natural Gas, Floating Storage Unit, Offshore Support Vessel, and Subsea Construction assets to the oil and gas industry.

"I want to express my appreciation and gratitude to Amarith for the exceptional work done on the project ensuring its success. I greatly appreciate the assistance and technical guidance provided by Amarith during the variation order for the pump length along with the regular meetings which kept us up-to-date on all the progress and allowed us to address any concerns or issues pro-actively."

Despite the constraints of the pandemic, the team provided detailed and thorough reports, which gave me confidence in the project's quality and performance. The final product received and installed in Singapore was excellent. I am thoroughly impressed with the quality of workmanship from Amarith. I have no hesitation in recommending them for future projects."

Zakaria Mohamed

Lead Technical Project Engineer
Bumi Armada