

Amarinth designs low shear gas powered API 610 OHI pump skid package for Petronas Semarang Enhanced Oil Recovery scheme

case study



Exploiting aging assets

The Semarang Enhanced Oil Recovery (EOR) scheme was established to extract additional oil from ageing offshore assets in Malaysia.

This additional extraction creates an increase in the produced water from the well and so extra pumping capacity is needed for the produced water treatment systems.

The original platform was designed as an unmanned satellite. The concept being that it would be self sufficient with all of the major equipment driven by gas motors fuelled from gas produced by the well stream.

Low shear duty

To provide additional pump capacity for the removal of oil from the produced water, Petronas approached Amarith for one of its API 610 OHI B-Series pumps which was to be driven by a gas powered motor.

The oil removal process requires that the oil and water are not emulsified as the produced water is pumped into the separator and so the pump had to be capable of low shear duty.

Furthermore, the platform had limited space and the total package was required on a short lead time to meet the project deadline.

Bespoke turn-key solutions

Although pumps operated by diesel motors are not uncommon, gas motor powered pumps are very rare. Therefore from the outset the skid package became a bespoke turn-key solution with Amarith working closely with Petronas and with its own agent in the region, Geveke Malaysia.

The specially designed gas powered motor ran at 1800rpm and Amarith was able to match this to the pump using a direct drive rather than the usual gearbox, saving on cost and time and creating a more reliable solution.

To fit into the available space on the rig the gas motor, the pump and all the ancillary equipment was packaged into a frame that was 3600mm long, 1990mm wide and 2460mm high.

ATEX requirements

The skid package was to be located in an ATEX Zone 2 potentially explosive atmosphere and so the motor was packaged with ATEX compliant electronic controls. Furthermore the exhaust manifold was wrapped in a water cooled jacket and a spark arrestor and flame trap were installed.

With the possibility of poor air quality, which if ingested into to the motor could result in catastrophic consequences, the air intake incorporated a sensor that would shut the motor down if the air wasn't suitable. Backup hydraulic starting was also installed in case of an electrical supply failure.

Air freight

To meet the tight deadlines on the project, Amarith, working with its agent Geveke, organised to air freight the completed skid package to Petronas saving over 4 weeks on the usual sea freight time. Finally, to ensure the new pumps operated successfully, Amarith provided engineering expertise for commissioning along with on-site training for the engineers.



Petronas

Petronas was founded in 1974 and has become the national oil and gas company of Malaysia and is wholly-owned by the Government of Malaysia. Together with its subsidiaries and associated companies, Petronas, a Fortune 500 Global company, has fully integrated oil and gas operations in a broad spectrum of the oil and gas value-chain.



"Amarinth's delivery of this unique skid package and ability to provide a designed solution to the existing platform demonstrates their experience and capabilities for Enhanced Oil Recovery."

Dato' Satwant Singh Dhillon
Geveke Malaysia Sdn Bhd