

Shell creates worlds first floating LNG production vessel, using Rosemount CMS

RESULTS

- Flexible system architecture enables future adaptations
- Improved operator efficiency
- Maintenance efficiency improvements
- Maximize inherent safety by a fully-integrated automation system

APPLICATION

Shell has developed a floating LNG (FLNG) system consisting of a number of sub-sea wells connected to a barge. The barge serves to support the gas treatment facilities and liquefaction plant, and to provide storage volume for the produced LNG. The \$10 billion investment will be the world's largest vessel and first offshore LNG facility. Beginning in 2017, the vessel will produce 3.6 million tons of LNG, 1.3 million tons of condensate and 0.4 million tons of LPG per year.

Cargo monitoring system in LNG, LPG, condensate and slop tanks with overflow- and high level monitoring.

Level monitoring in integral- & free standing tanks, including oil water interface measurements in several tanks.

CUSTOMER

Royal Dutch Shell.

CHALLENGE

When Shell was designing the concept for the offshore production of LNG it was important to be economically and technically competitive with onshore LNG production. The suppliers invited to participate in the development of the project were to deliver the best solution and technical support so that the final design was a solution that minimized technical risk and enhance productivity.

Because this is the first floating liquid natural gas production vessels in the world, the project needed proven, state-of-the-art solution backed by superior technical expertise. The new developed process also required more flexible solutions and fewer equipment items in order to maximize the units' operation. The systems designed have to remain on-site at full sea for at least 20 years, so operability and reliability was demanded and low life cycle cost as well.

High safety was another prime consideration and therefore solution reducing the risk to escalation of events was chosen.



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The Prelude FLNG facility will be 488m long, 74m wide and will displace around 600,000 tonnes of water. It will be the largest floating offshore facility in the world.

SOLUTION

A multi-disciplinary expert team from Emerson was engaged early in the project to design a unique fully integrated automation solution, deliver maximum uptime, cost effectiveness and safety. With DeltaV™ and Rosemount Cargo Monitoring system from Emerson a proven state-of-the-art solution has been developed.

The Cargo Monitoring system includes surveillance and measurement of LNG/LPG tanks, condensate, slop and other tanks. With Rosemount Cargo Monitoring System connected to the DeltaV™ system a complete measurement and control system was provided.

Reliable and accurate level measurements of the LNG and LPG tanks are attained with the new developed still pipe radar gauge, Rosemount TankRadar 2 in 1. The radar gauge is unique by its design with two level measuring channels, doubled pressure and up to 6+6 temperature spot sensors in same tank penetration. Fewer connection boxes per tank meet the requirements of cost effective and painless installation inside as well as outside the tanks. It also minimizes the risk of water intrusion and maintenance.

With the prior use SIL approved Rosemount 5300 and Rosemount 5400, the level measurements for the IPS are handled with integrity and high reliability.

The demand for oil water interface measurement was solved with the Rosemount 5300 developed for challenging level and interface measurements on liquids.

For many of the integral tanks the Rosemount 5400 gauges is applied. The gauge is known for its high measurement reliability, because of Dual Port Technology that enables a stronger signal.

In total more than 160 Rosemount 5300 and Rosemount 5400 are used to monitor the levels in the integral tanks, e.g. ballast.

For the rest of the tanks Rosemount CMS TGU 55 measure the level in the condensate and slop tanks.

The high sensitivity radar transmitter Rosemount CMS TGU 56 will measure draft. The gauge is an intelligent 4-wire, non-contacting radar level transmitter.

With the well-proven Rosemount gauges it is possible to handle the level monitoring of the FLNG in a cost-effective and safe way. The LNG monitoring being done with CTS performance includes the operative requirement of verification during operation.



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