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Yokogawa Delivers High Fidelity Plant Simulator that Improves Operator Performance and Ensures Operational Excellence

Location: Qalhat, Sultanate of Oman**Order date:** 2013**Completion:** 2014**Industry:** LNG Supply Chain

الشركة العمانية للغاز الطبيعي المسال ش.م.ع.

Oman LNG L.L.C.

Executive Summary

Oman Liquefied Natural Gas LLC (OLNG) is a limited liability joint venture established by a royal decree and operated under the laws of the Sultanate of Oman. It produces and sells liquefied natural gas (LNG) and byproduct natural gas liquids (NGLs).

The company undertakes, directly or indirectly, project operations and activities necessary to liquefy, store, transport, and market Oman's natural gas, and delivers LNG to customers worldwide. The company operates three liquefaction trains at Qalhat near Sur that have a combined capacity of 10.55 million tons per annum.



In 2013, Yokogawa received an order to supply an operator training system (OTS) for the OLNG natural gas liquefaction trains at the Qalhat site. OLNG directly awarded this OTS order to Yokogawa Middle East & Africa in recognition of the long-term relationship between the companies and Yokogawa's strong commitment to its projects. This OTS was successfully installed and commissioned in November 2014. The OTS is comprised of an OmegaLand simulation engine and an automation system made up of a CENTUM VP integrated production control system.

These are the same automation and safety systems used with the actual liquefaction trains, with identical control response, graphics, and alarm behavior. This enables high fidelity modeling of the LNG liquefaction process and closely matches the behavior and operational environment of the actual liquefaction trains. This solution allows plant upsets and equipment malfunctions to be simulated in an environment that is identical to that at the actual plants, allowing operators to develop the skills needed to efficiently handle plant processes and deal with emergencies.

The Challenges and the Solutions

The OTS that Yokogawa delivered to OLNNG replaced a 15 year old OTS that had been used for operator training and certification. The Yokogawa OTS solution has helped the OLNNG trainers and operators overcome the shortcomings of the old OTS, which had a limited number of standard malfunctions and insufficient tag space. There were also shortcomings in the compressor and gas turbine logic because the system did not closely mimic the behavior and environment of the actual plant.

After an intensive investigation that took into consideration the existing training challenges at OLNNG, Yokogawa drew on its vast experience in the industry to address this customer's training requirements by proposing a direct connect solution that had the added scope of machinery and utilities. With its quality oriented approach, Yokogawa delivered an OTS solution that was able to reduce operational errors and achieve plant operational excellence. The delivered model was comprehensively tested against the plant historian data on the critical process dynamics of Air Products and Chemicals, Inc., main cryogenic heat exchanger (MCHE), and the fractionation sections, and was verified against licensor data. All frequently experienced process upsets and operator recovery procedures were tested to achieve the dynamic accuracy and fidelity needed for critical LNG processes.

Lifecycle commitment

As a part of its deliverables, Yokogawa has committed to a lifecycle program for a 10 year period, during which time it will strive to maximize ROI and the value contributed by the training simulator. Over the course of this program, Yokogawa will keep the delivered OTS up to date and seek to minimize system downtime.

Customer Satisfaction

Here are some of the comments from our customer that attest to the quality of this solution:

"It is not always essential to spend large sums on a solution; customers also look for an optimized and skilled engineering approach."

"The behavior and fidelity of the model are very close to the live plant."



For more Information and Contact

www.yokogawa.com/sbs/OSC/VMmaster-overview.htm

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