SUCCESS STORY

World's First Offshore Regasification Terminal Relies on Yokogawa ICSS (CENTUM CS 3000, ProSafe-RS)

Location:	Porto Viro, Italy
Order date:	2008
Completion:	November 2009
Industry:	LNG Terminal

Adriatic LNG
New energy for Italy

Executive Summary

Terminale GNL Adriatico Srl, commonly known as Adriatic LNG, was established in 2005 by Qatar Petroleum, ExxonMobil, and Edison for the purpose of designing, building, and operating the world's first offshore regasification plant. Located in the northern Adriatic Sea, approximately 15 km off the coast from Porto Levante, Italy, the Adriatic LNG Terminal (ALT) is a huge state-of-the-art gravity based structure* (GBS) with facilities for the mooring and unloading of liquid natural gas (LNG) vessels, two 125,000 m^3 LNG storage tanks, and an LNG regasification plant. Gas from this facility is shipped to the mainland via a newly built pipeline that connects to the national gas distribution network.

Sitting in waters that are 29 meters deep, the ALT is 375 meters long and 115 meters wide, with a main deck that rises 18 meters above sea level and a flare tower that tops out at 87 meters above sea level.
With its nominal 8 billion m^3 per year regasification capacity (equivalent to 775 million cubic feet per day), approximately equal to 10% of the country's gas consumption, the ALT is making a significant contribution to the diversification of Italy's energy sources, and is thus contributing to the country's energy security.

The LNG for this plant comes mainly from Qatar but also from Egypt, Trinidad & Tobago, Equatorial Guinea and Norway. Edison has a 25 year contract for 80% of the gas from the ALT, and the remaining 20% is open to third parties. Of this latter amount, 12% is allocated according to the procedures defined by the Italian Ministry of Economic Development and the Regulatory Authority for Electricity and Gas.

Acting from the early stages of this project as main instrumentation and control contractor (MICC), Yokogawa Europe installed an integrated control and safety system (ICSS). The individual components of this system are the CENTUM CS 3000 distributed control system (DCS) and the ProSafe-RS safety instrumented system (SIS) for IPS/F&G, and it is supplemented by the STARDOM network-based control system for pipeline monitoring & leak detection at block valve and metering stations and an operator training system (OTS) from Omega Simulation.

* A structure that sits on the ocean floor and is held in place by gravity

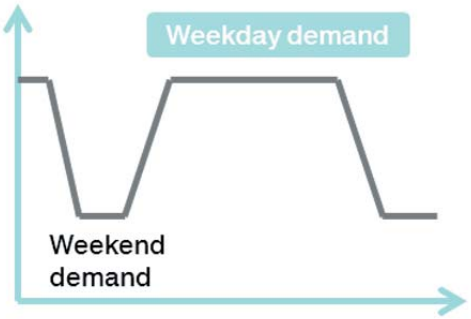
The Challenges and the Solutions

1. Safe operation

At the ALT, safety is the top priority. A robust and reliable ICSS made up of the CENTUM CS 3000 DCS and the ProSafe-RS SIS, together with a leakage detection system powered by the STARDOM network-based control system, provide non-stop disaster protection. Operation of the ICSS from the CENTUM human machine interface is convenient and user friendly. The SIS and DCS faceplates have the same look & feel, and security measures are in place that restrict SIS faceplate access to authorized individuals. In an emergency, operators have all the information they need to take immediate and effective measures including the operation of safety valves.

2.Steady supply

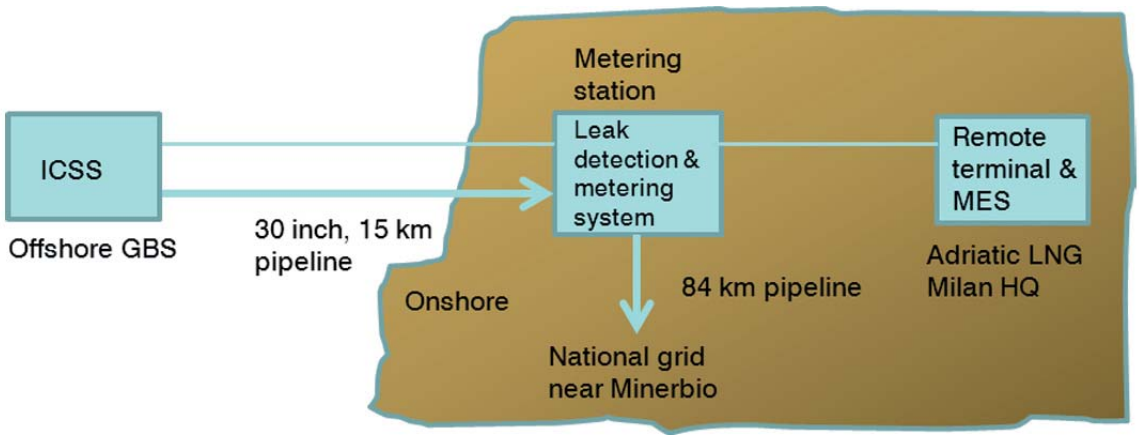
Providing a steady supply to the national grid is another important role of the ALT. The terminal has two tanks that can store up to 250,000 m^3 of LNG, an amount sufficient for meeting four days of demand, so punctual LNG carrier scheduling and efficient LNG unloading and vaporization are required. The gas quality is sampled by a GC1000 gas chromatograph and controlled to meet the specifications of the national grid. Thanks in good part to the robust reliability of the integrated CENTUM CS 3000 and ProSafe-RS systems, the terminal has continued to operate 24 hours a day, 7 days a week, with an availability approaching 99.5%.



Weekly demand pattern

3. Visualization of terminal operations

Systems from other vendors such as the LNG unloading system, tank gauging system, pipeline monitoring system, metering system, and gas turbine system are all integrated through a Modbus interface with the ALT's main CENTUM control system. The resulting ability to visualize process data from throughout the terminal allows the preparation of production reports, calculation of plant efficiency, and analysis of the performance of individual processes. Reports on the accumulated running time of rotating equipment such as LNG pumps and compressors are compiled, allowing operators to determine the optimum timing for equipment maintenance and replacement. The visualization of data from throughout the terminal puts the right data in from of the right person, enabling the right decision to be made at the right time.



4. Asset Optimization

The ALT is located offshore, so maintenance of the facilities and the control system, instrumentation and equipment is essential. To maintain a stable operation, unexpected field device failures must be prevented. The ALT uses the Plant Resource Management package (PRM). Field digital technology allows an operator to clearly see the status of field devices at any time. Operators and maintenance crews continuously monitor field devices from the Control Room using the PRM. Maintenance activity is scheduled before predicted device failure. Yokogawa continuously supports the PRM in order to ensure optimized management of the asset.

Customer Satisfaction

Russell Golson, Operations Manager at the ALT, said, “We are confident in our ability to provide a steady supply of gas to the national grid because our integrated control and safety system is reliable. LNG carrier scheduling, unloading, tank storage, and vaporizing are all procedure based operations and are carried out flawlessly. The terminal’s availability is about 99.5%. We strive to automate terminal operations as much as possible. All process data is clearly visualized for optimum operation, maintaining a clear gas business plan and creating optimal LNG supply chain scenarios.”

Central control room