

Energy Sector Oil and Gas Division

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Siemens seal-less compressor completes test program for future subsea processing

STC-ECO – the Siemens seal-less compressor unit for dirty-gas and subsea applications – has successfully completed its factory test program. Following a highly comprehensive program aimed at qualifying the unit for subsea gas compression, the machine will now undergo a further extended test program. Completion of the factory acceptance tests is a major milestone in the system qualification program and for marinization of the equipment, which will be an important cornerstone for subsea processing at a water depth of 3,000 meters in the future.

Factory acceptance testing of the STC-ECO compressor system marked an important milestone. The test covered thermodynamic performance including internal cooling, rotor dynamic behavior, motor performance and stability of the bearing system. The next phase of the qualification program will concentrate on reliability testing with the focus on performance and mechanical robustness. A further phase will target wet gas such as liquid injection into the main gas stream and further endurance and robustness tests. The entire development and qualification program aims at the achievement of a complete, mature system, qualified for subsea compression.

Repairs to compressors installed subsea cannot be carried out on the seabed as access to the equipment is difficult and costly. This means that units have to have long service intervals and must be reliable and robust. The subsea compressor has to deal with wet gas containing condensate, natural gas liquids and whatever else comes out of the well – sand, for instance. The Siemens STC-ECO compressor features a high-speed induction motor and multistage centrifugal compressor on a single shaft in a single casing. For the first time there is no need for auxiliary equipment such as a seal gas system, lube oil system, gearbox, etc. The more components a system has the less reliable it becomes. Siemens has reduced the number of required components and auxiliaries for a compression system to a minimum.

In 1999, under the project name ECO-II (economic and ecological) the seal less compressor was jointly developed by Siemens and Shell. In the fall of 2006, the prototype was deployed at NAM Vries-4 gas field in the Netherlands. It has been tested for more than 20 months in onshore applications with dirty process gas and was subjected to a wide range of contaminants, including sand and water. Following the completion of field testing, the compressor has been rebranded STC-ECO and now operates as a standard machine for dirty-gas applications. It has accumulated over 16,000 operating hours in the field.

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