



■ The Mellitah Gas Compression Station owned by GreenStream on the Libyan coastline at the head of the 323 mile (520 km) 32 inch (81 cm) sealine exporting Libyan natural gas to Italy.

## NEW SEALINE TO DELIVER LIBYAN NATURAL GAS TO ITALY

*Pipeline Will Transport Natural Gas from Mellitah Gas Compression Station on the Libyan Coast to Sicily*

**By Roberto Chellini**

On October 7, 2004, Libyan and Italian authorities officially inaugurated the natural gas transmission system which transports natural gas to Italy, crossing the Mediterranean Sea from the Wafa area in the Libyan Sahara desert. Once arrived in Gela, the gas enters into the Italian network system.

Within the natural gas transmission system, GreenStream BV, a company owned by Eni SpA and NOC (the Libyan State Company), owns and operates the Mellitah Gas Compressor Station (MGCS) on the Libyan coast, the sealine crossing the Mediterranean Sea and the Sicily Receiving Terminal (SRT) in Gela.

MGCS, located on the Libyan coast 43 miles (70 km) west of Tripoli, is the gathering point for gas coming from two different areas: 141 Bcf/y ( $4 \times 10^9$  m<sup>3</sup>/y) of natural gas will be piped from the onshore Wafa field, in the Sahara desert near the border with Algeria, to Mellitah by a 329 mile (530 km) long 30 in. (76 cm) gas line and a parallel 16 in. (41 cm) oil and condensate line; 211 Bcf/y ( $6 \times 10^9$  m<sup>3</sup>/y) of natural gas will come from the NC41 offshore field, 68 miles (110 km) north of Mellitah. This field has been denominated Bahr

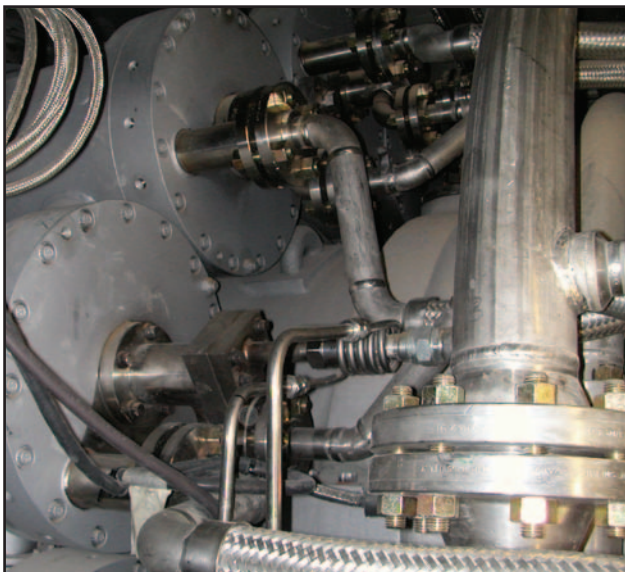
Essalam and is served by the Sabratha platform. Offshore products flow to Mellitah through a 36 in. (91 cm) gas

line and a 10 in. (25 cm) condensate line.

Out of the total 353 Bcf/y ( $10 \times 10^9$



■ Detail of the HRSG producing steam for the adjacent gas processing plant.



■ Detail of the gas turbine combustion chambers with the DLE fuel system.

m<sup>3</sup>/y) of gas produced, 282 Bcf/y ( $8 \times 10^9$  m<sup>3</sup>/y) will be exported to Italy and the remaining will be distributed locally.

Responsibility for engineering, procurement and commissioning at the MGCS has been awarded by GreenStream BV to Nuovo Pignone SpA in a joint venture with Bonatti SpA. The contract includes the engineering of the process, configuration of the turbocompressor packages, procurement, construction and commissioning of the whole station. The JV also assists the customer in operation and maintenance of the plant since start-up is through a global service contract.

This station, covering an area of 22.2 acres (9 ha), hosts four compression trains. Each compression train features a heavy-duty MS 5002 D gas turbine provided with DLE combustion system driving two barrel-type Pignone centrifugal compressors through a Maag step-up gearbox. The first compressor, BCL 455-4 compresses the gas received from the gas treating plant at 406 to 1044 psi (28 to 72 bar). After cooling, the gas is further compressed by the high pressure BCL 356-5/A compressor from 1029 psi (71 bar) to the delivery pressure of 2030 psi (140 bar), this pressure will successively be boosted at 2175 psi (150 bar). Three units will be kept in continuous service while the fourth one will remain in standby.

All compressor impellers are of the 3-D welded type belonging to the latest, high efficiency family. The compressors feature tandem dry gas seals buffered with air.

The Maag gearbox type SG 500 is increasing the speed of the turbine power shaft 4670 rpm to 11,681 rpm to drive the two compressors.

The MS 5432 D gas turbine has an ISO rating of 32 MW at 4670 rpm and a mechanical efficiency of 30.3%, however the total efficiency is increased by recovering a large share of the exhaust heat. The exhaust lines of each group of two gas turbines are conveyed to one HRSG, which produces process steam at 101 psi (7 bar) sold to the adjacent gas treatment plant. Being that three of the compressors are kept on duty, one of the boilers is kept in service producing 50% of its steam capacity.

The Mellitah environment is described as a slightly corrosive marine shore environment with sandstorms in the summer. In order to meet the station expectation life, the machines have been protected by suitable laggings. ■