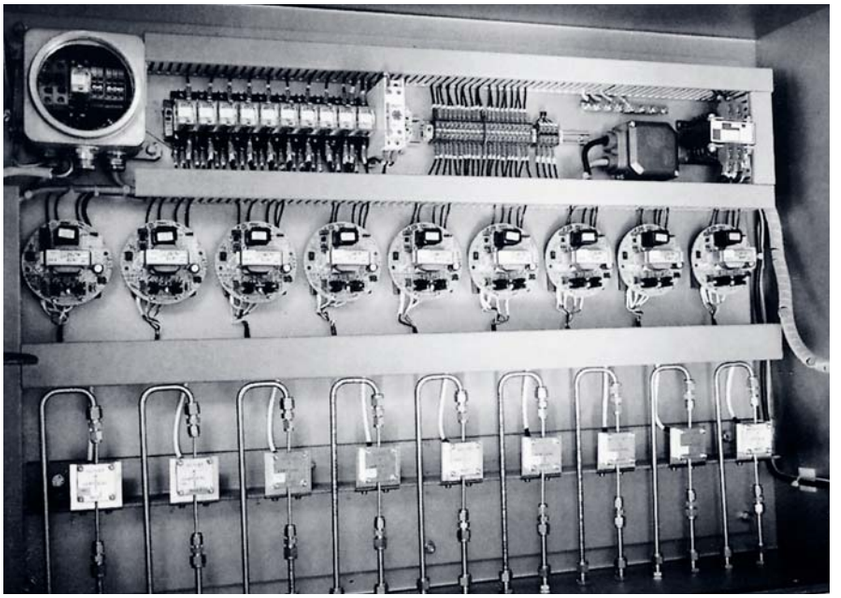
Compressor lube oil monitoring



Oil and Gas Case Study 202-2

Application

One of the largest oil and gas producers in the United Kingdom operates 14 offshore production platforms in the North Sea. The largest of these platforms is capable of producing 60,000 barrels of crude per day and is critical to the producer's entire North Sea operation. In addition, it acts as a pumping station for 12 other platforms, pumping an average of 1 million barrels of crude per day to onshore facilities.

Because the platforms are located in remote areas, compressors play an important role in their reliable operation. The compressors are used to pump oil to onshore facilities, supply fuel gas to other compressors and supply fuel gas to platform utilities. To maintain successful operation, the compressors must receive a continuous adequate flow of lube oil.

Challenge

The main compressors at this North Sea platform are critical to pump export oil onshore and to supply fuel gas to utilities on this and on other platforms. Failure of the compressor on three separate occasions caused the producer significant operating problems and monetary loss. Factors contributing to the failure costs are:

- Using costly diesel fuel, rather than produced gas, to run the export pipeline compressors
- Excess fuel gas originally intended for compressors had to be flared because there were no storage tanks on the platform. This wasted fuel and added to pollution concerns.
- Platform utilities became inoperable along with compressor repair costs

Each operation failure was attributed to lube oil flow loss on the main compressor. In order to maintain reliable compressor operation, lube oil must be constantly supplied to the compressors from nine separate lines. The flow rate on each line is extremely low and critical. A cost effective reliable lube oil monitoring system was necessary to prevent future failures.

Project parameters

User	Offshore drilling
Location	North Sea, United Kingdom
Media	Lube oil
Pressure Range	10 to 20 psig [0.7 to 1.4 bar(g)]
Temperature Range	40° to 100°F [4.4° to 38°C]
Flow Alarm Setpoint	0.4 cc/min

Solution

To monitor compressor operation, FCI designed and installed a lube oil flow detection system using the FR73 inline thermal ultra low flow monitor. The FR73 detects liquid flow rates from 0.01 to 2.0 cc/min meeting the extremely low flow rate for the compressor lube oil. The FR73 flow detection system included a circuit board with local relay alarm outputs, an external relay alarm output and a purged electronics enclosure.

After installation, the FR73 detected loss of flow in the compressor lube oil line and activated a relay alarm prompting the producer to take corrective action and prevent future unexpected compressor failures. The FR73 lube oil detection system has paid for itself many times over while proving to be an extremely efficient and cost-effective solution for this critical application challenge.

FCI flow switch specifications

Model	FR73 ultra low flow inline monitor
Media	Lube oil
Flow Range	0.04 to 2 cc/min
Pressure Range	to 1000 psig [69 bar(g)]
Temperature Range	-100° to +350°F [-73° to +177°C]

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