

Control Components Solves Critical Valve Problems on North Sea Oil Platform

Due east off the coast of Aberdeen, Scotland, in the North Sea, lies one of the most significant hydrocarbon deposit finds the last quarter of the century. With reserves estimated in excess of 23 billion barrels, these fields rank as the ninth largest oil deposit in the world. But as rich as the fields may be, the North Sea also has the distinction of being one of the most difficult areas in the world to explore and exploit.

It is also one of the most dangerous. Storms rage through this part of the North Sea on an average of 273 days per year. Waves up to 90-foot high toss tankers and service craft around like children's toys, while 110-knot winds wrack platforms for days on end.

This brutally harsh environment tests the will and strength of both the personnel who work and live out on these slender metal islands and the environment they rely on for their sustenance and survival. Consequently, performance and reliability are two of the foremost qualities demanded of platform equipment in this area.

On one of these North Sea platforms the equipment was not performing up to expectation. Shortly after commissioning, the platform began to experience problems with three of its compressor recycle flow control valves. From the beginning, the valves were generating much more noise than they should have been. The senior engineer on the project was afraid that this might be an indication of poor velocity control through the valves. If that were the



8", 1500 ANSI Compressor recycle valve retrofitted with DRAG trim



12", 600 ANSI Compressor recycle valve retrofitted with DRAG trim

case, then the operators were going to have an erosion problem on their hands in short order.

Within three months the engineer's fears were realized. The three valves in question were leaking gas in the closed position. In addition, they were slower responding in modulation mode than called for in the original specifications, and they exhibited an unacceptable level of instability in positioning, especially between the 0-10% open position.

It was essential to the platform's owner that the three valves be repaired. "The anti-surge valves provided the primary protection for their compressors against damage," said Alan Wright, CCI's sales engineer who worked to solve the platform's valve problems. "If anything were to have happened to the compressors because of a valve failure, then the platform would have been out of business."

The three valves in question were all globe valves ranging in size from 6" to 12", with valve trim sizes of 2 1/2", 4" and 6". Body ratings were API 10,000 lbs. for the 6" valve, ANSI 1500 for the 8" valve and ANSI 600 for the 12" valve. All were Class V rated for seat leakage, and none were exceed 90 dBA at 3 feet (1 m). Pressure drops across the valves were 200 bar to 10 bar (3000 psi to 150 psi).

The original valve supplier proved unable to correct the valve's problems, and that's when the owners turned to CCI. It was quickly decided that the best approach would be

to take the platform's spare valves, machine the interiors for retrofit, and install new DRAG trim. This would save the cost of casting new valve bodies and would also meet critical maintenance deadlines.

DRAG valves technology was selected for use in this severe service application for several reasons. First, the multi-stage, stacked disk design would better control gas velocities through the valve as pressures were reduced over twenty-fold. With better velocity control would come a reduction in noise and the elimination of erosion on the seating face. This would yield greater control over gas flow. Second, platform engineers were shown early-on trim and valve design would give them a quicker response in modulation mode and would give them better positioning stability because of the valves' overall greater integrity. Third, CCI's quick turn-around capabilities would allow them to meet the tight deadlines they found themselves up against.

From start to finish the entire job- including an additional 6" flare-to-discharge valve- took 11 weeks. The platform engineers were able to install the valves during a scheduled maintenance outage, and the platform was up and running again as planned.

According to CCI's Wright, the valves are performing well. "Noise levels are at or below spec, and the leakage problems have all but disappeared. Response rates are excellent and flow control is greatly improved. Not only did they get obviously superior valves, they also got them within an exceptionally short timeframe. This kind of quality and service we promise to all of our customers. After all, It's our job to make our customers' lives easier," concluded Wright. "It's tough enough out there without equipment failure making things worse.

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