A major electrical infrastructure company designs and manufactures power generation turbines that use natural gas, oil, coal and other fuel technologies. The company has standardized on One Series model 2XLP43 for measuring gage and differential pressure to replace traditional transmitters, UE mechanical switches and mechanical gauges on their seal oil skids.

THE PROBLEM:

The company needed to lower costs, reduce maintenance and provide more reliable hydrogen-cooled generators for their customers worldwide. In order to monitor pressure remotely, provide switch control and be able to instantly view pressure readings, three discrete instruments were needed – a pressure transmitter, a pressure switch and a local gauge. These three instruments were all connected to the same pressure source using the piping tree arrangement to the right.

Counting all of the tubing, elbows, t-fittings and connections to each instrument and the pressure source, potential leak paths quickly became a problem. Not counting block and bleed valves, there were a minimum of 12 threaded connections where the media could leak. The cost of the stainless steel tubing and fittings, the cost of the labor to plumb and leak-test and the maintenance required should clogging or leaking occur were all considered. Adding in the cost of the instrumentation and considering reliability, clearly a better method was needed.

THE SOLUTION:

The company needed a highly reliable instrument that could evaluate and report its own health status and provide the functions of the three instruments while reducing overall costs. The One Series 2XLP model is primarily a smart pressure transmitter with display that includes a programmable electronic switch – switch + gauge + transmitter all-in-one.

All One Series models include a self-diagnostic feature called I Am Working™ that monitors several vital instrument functions and reports health status three ways – locally on the digital display and remotely via the 4-20 mA analog and using discrete switch signals.

The One Series’ I Am Working™ feature watches for potential faults that could render the device unreliable. Unlike other blind instrumentation, the One Series can report detected faults with its own imbedded software, keypad, watchdog timer, power, switch and sensor. For example, if a clog occurs in an impulse line connected to the pressure sensor, the One Series can detect and report this fault before it becomes a larger problem – an undetected fault. In this case, the display will read “PLUG” while the switch opens (fail safe) and the 4-20 mA output saturates to 24 mA. The PLC evaluating these outputs then initiates an alarm or emergency shutdown, as appropriate.

For the company, the One Series carries worldwide hazardous location approvals and the units of measure are field adjustable, so no matter where in the world these seal oil skids land, the units of measure can be set to the local preference during commissioning. Reliability data is provided by a third-party failure modes and effects diagnostic analysis (FMEDA) report, available on UE’s website.

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