



Case study

Baker Hughes' intelligent subsea pigging solution helps bring remote pipeline into service, saving time and money

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Background

Operators of remote offshore pipelines – particularly those with subsea launch and receive traps – face many challenges to successful inline inspection (ILI) activities. Line conditions, geographical complexities and changes in pipeline construction can adversely impact the accuracy of ILI data. Concerns such as these were in play at a platform in one of the northern-most oil and gas production fields in the world, the North Sea.

To bring a 7-km span of 10-inch gas injection pipeline into service, the EPC contractor was in search of an inspection technology that could handle a subsea launch at a 430-meter water depth, and a cost-effective solution. Due to extremely challenging weather conditions associated with this region, an inspection operating window was only available between the months of May and September.

The contractor turned to Baker Hughes for an intelligent pigging solution to deliver the quality baseline inspection data needed to successfully open the line.

Solution

Baker Hughes, Process & Pipeline Services (PPS) business was awarded a contract in 2017 to undertake the inspection using its 10-inch MagneScan magnetic flux leakage (MFL4) inspection tool. This waterproof, high resolution tool performs metal loss detection and geometry inspection, with the option of pipeline mapping using an inertial measurement unit (IMU). The PPS team initially mobilized two MFL4 tools in standard build configuration.



However, when it later was determined that a line restriction prevented safely running the standard tools, the initial effort was demobilized. Next, the PPS team provided an engineered solution to reduce the MFL4 tool's minimum bore passing capability. With a custom-engineered reduced bore passing application fitted to the tool, testing was conducted prior to remobilization to ensure that the tool could effectively magnetize the nominal bore flowline and detect and size features within the agreed specification.

Results

This first-time inspection encountered significant challenges – including a tight equipment delivery schedule to the remote location via a vessel on hire by the customer. To help mitigate these challenges, the PPS team sent a second “back-up” MagneScan MFL4 inspection tool in case the first unit failed. While the contingency tool was never put to use, its presence offered the customer peace of mind due to its potential to save significant time and money if a second tool had been needed.

In September 2019, the first MagneScan tool was successfully pumped through the pipeline. The team performed a single run inspection with fully integrated caliper measurement to

identify and assess geometry deformations. An IMU was used to precisely identify the centerline of the pipe continuously down the line. After an in-field data quality assessment confirmed that the inspection tool had functioned correctly and recorded data for the full length of the pipeline, the PPS team completed a successful baseline inspection analysis of the gas injection pipeline and issued a report.

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Baker Hughes’ ability to swiftly provide accurate inspection data helped the customer save both time and money in the creation of its first Integrity Management Plan to maintain the condition and preserve the service life of this key pipeline in a strategically important gas field.