Overcoming Heavy Bore Restrictions: InVista™ In-Line Inspection Technology

Project Overview
The Pipeline Projects Department at a major oil transportation company in Canada planned to inspect a 6-inch sour gas pipeline with conventional in-line inspection (ILI) methods; however, it was determined that conventional ILI methods were not a viable option due to heavy tool damage on gauge pig runs. Some of the pipeline conditions were unknown to the client due to acquisition of the line from another company. The Projects Engineer believed there was a high probability of a significant dent in the pipeline, and that it would be necessary to excavate and make modifications to the line in order to complete an in-line inspection.

Solution
The client contacted Quest Integrity to inspect the line using InVista™, an ultrasonic ILI tool for difficult-to-inspect and unpiggable pipelines. Because of the tool’s large collapse factor, it successfully navigated this sour gas line despite heavy bore restrictions. The InVista tool captured 100% of the interior and exterior pipeline data and Quest Integrity provided the client with a complete data set for the line including wall thickness changes, bend locations and inner radius profile within 30 days.

Challenges
InVista identified 5 wall thickness changes in one 20-foot section of the pipeline. These changes ranged from 0.864 inches (21.95 mm) to 0.265 inches (7.1 mm). In addition, the tool successfully navigated and inspected the two joints present in this section. It was noted these joints accounted for the tool damage that occurred on previous gauge tool runs instead of a significant dent.

Results
A full API 579-1 / ASME FFS- 1 2007 Fitness-for-Service assessment was conducted utilizing the high-quality inspection data provided by the InVista tool. The data was analyzed for wall thinning and anomalies such as corrosion, denting and ovality using LifeQuest™ Pipeline software. The Remaining Strength Factor (RSF) and Reduced Maximum Allowable Operating Pressure (MAOPr) were also determined for the line. Below is an inspection summary:
+ 130 external metal loss anomalies were individually identified.
+ Wall loss at 58.0% was identified in one section of the pipeline.
Benefits
The client did not have to excavate or make any line modifications in order to complete the inspection, saving time and money. The inspection and assessment pinpointed specific areas of degradation, allowing the client to make the necessary repairs and return the line to service quickly. In addition, InVista confirmed the cause of the gauge tool damage. The Projects Engineer was very pleased with how quickly Quest Integrity executed the project and delivered the data, allowing them to make confident, timely decisions for the pipeline.

Benefits of the InVista Technology
Overcomes challenges associated with traditionally difficult-to-inspect and unpiggable pipelines.

Improved Safety and Flexibility
+ Lightweight, self-contained, compact tools are handled easily; no lifting machinery required
+ Superb minimum passage and bend capabilities; negotiates damaged or restricted pipe
+ Lower pressure differential requirements and bi-directional capability minimize line disruptions

Reduced Operational Risk
+ Unique design reduces wear, impact and debris collection associated with conventional in-line inspection technology
+ Direct high-density UT measurement delivers accurate, repeatable results
+ Solutions oriented: analysis of all line data vs. individual flaw locations

Cost Effective
+ Single pass combined geometry and metal-loss data provides 100% overlapping coverage
+ Linear UT sizing minimize verification digs and improves excavation and repair confidence
+ Permanent line modifications not required

Time Efficiency
+ Efficient inspections minimize offline status
+ Onsite turnaround and rapid data analysis allows real-time operating decisions
+ UT inspections do not permanently magnetize pipe, thereby eliminating demagnetization repairs

Quest Integrity, a TEAM company, is a global leader in the development and delivery of asset integrity and reliability management services. The company’s integrated solutions consist of technology-enabled, advanced inspection and engineering assessment services and products that help organizations improve operational planning, increase profitability, and reduce operational and safety risks. Quest Integrity is built on a foundation of leading edge science and technology that has innovated and influenced industry best practices since 1971.