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SmartPlug® Isolations Enable Safe, Efficient Pipe Replacement at Saudi Arabian Industrial Plant

Power and Water Facility Remains in Service during Project at Two Underground Road Crossings

Tulsa, OK (October 3, 2018) - Global pipeline solutions provider T.D. Williamson (TDW) recently paired its SmartPlug® isolation system and hot tapping and plugging (HT&P) services to enable a pipeline replacement at a Saudi Arabian industrial plant while the facility remained in service.

The 20-inch pipeline, which transports fuel oil 18.5 km (11.5 mi) to a water desalination and power generation facility, required pipe spool replacements at two underground road crossings. To avoid interrupting the plant's operation during the replacement project, TDW performed seamless back-to-back, double-block in-line isolations at each road crossing using two remote controlled, non-intrusive 20-inch SmartPlug tools. Real-time 24/7 monitoring verified the integrity of each isolation, which remained in place for approximately five days.

Part of a comprehensive solution

TDW provided a comprehensive isolation solution at both road crossings. The twin operations included preparing the pipeline for the midline repair operation by safe hot tapping, isolating the pipeline with SmartPlug tools and installing completion plugs.

The company:

- Manufactured and supplied 2-inch fittings and performed hot taps on the pipeline at each of the road crossings. This was to facilitate draining and purging of the pipe section between the two SmartPlug tools in the line.
- Loaded, launched and pumped the SmartPlug tools through the pipeline using crude oil.
- Positioned, tracked and operated the tools using its SmartTrack™ in-line tool tracking system.
- Unset and retrieved the tools through the operator's existing scraper traps.

Efficient on-site tool maintenance meant the SmartPlug tools were cleaned, inspected, decommissioned and recommissioned within 24 hours, allowing the same tools to be used for both isolations.

Pipeline Performance™

Success achieved ahead of schedule

The operator achieved multiple benefits by using the SmartPlug system:

- The pipeline remained in operation, allowing transfer of oil to the plant during pumping of SmartPlug tools to and from the work sites.
- Because the pipeline remained oil-filled during the replacement work, recommissioning wasn't required. Only the sections that were replaced were drained and decommissioned.
- The replacement works were completed one week ahead of schedule.

Overcoming challenges of pipe geometry and pressure

The operation wasn't without its challenges, however. According to Morgan Swanlund, Project Manager for this operation, SmartPlug tools have a proven capability of passing 3D bends—although their limits were tested this time.

“The main technical challenge was for the SmartPlug tools to traverse a total of 373 bends of radius 1800 mm, typically positioned back-to-back, in each of the two runs,” he said. “This was successfully achieved in great part to the pre-engineering design of the SmartPlug tool by the Engineering team in Stavanger, Norway.”

Swanlund also noted that TDW put in place special precautions to safeguard people and physical assets during the operation, which took place from May through August—the peak of the Saudi Arabian summer.

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About T.D. Williamson

Drawing upon a 98-year history of industry leadership, TDW delivers a comprehensive portfolio of safe pipeline system solutions for onshore and offshore applications, including advanced isolation and repair, integrated pigging, and integrity assessment solutions.

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