PIPELINE OBSOLESCENCE: DECOMMISSIONING A BRANCH WITHOUT INTERRUPTING FLOW

Natural gas plants are built and taken out of service according to demand. When the need for product flow to an area ceases, or a more efficient route is designed, the plant becomes obsolete. The resulting decommissioning of the arm still connected to a productive wider network can be a complex undertaking. When a once thriving plant in Alabama was deemed no longer useful, the operator enlisted the services of global solutions provider T.D. Williamson (TDW) to perform hot tapping and plugging (HT&P) services on the line. The job entailed isolating the arm to be decommissioned and rerouting flow through a different section to ensure the continued supply of vital product to markets in Florida.

Obsolete Arm

The late 1990's gave rise to increased production of natural gas along the United States Gulf Coast. Specifically, Mobile Bay, in Alabama, became a popular building destination for gathering, transportation and processing facilities. One such facility was an in-line natural gas processing plant in Alabama that linked supply basins to markets in Florida.

As years passed, shifting market conditions eventually necessitated that the plant be taken out of service, but not without complications. Problematically, the plant connected to a 36-inch, 400-mile transmission line. This line, contrarily, was extremely active, feeding most of southern Florida.

Taking the plant out of service was no easy task. Any miscalculation could result in hundreds of thousands of customers deprived of service. With such high stakes, flow needed to continue throughout the plant's decommission. The operator hired TDW to perform HT&P services so that the plant could be disconnected from the main line—without interrupting flow. Having trusted them with isolation projects on two previous occasions, the operator knew that TDW's expertise would ensure the project was done with speed and precision.

Specific Requirements

The operator's situation presented TDW with several challenges necessitating a creative solution:

- Perform the isolation in a tight work zone.
- Isolate the transmission line's thicker-than-usual .875-inch pipe wall.
- Minimize the number of permanent hot tap fittings left on the line afterward.

STOPPLE® Train

Because of the space constrictions, STOPPLE® Train technology seemed best suited for the isolation. The system utilized two STOPPLE® plugging heads inserted into the line through a single fitting, ensuring a total seal and reducing the total the number of required fittings. Original STOPPLE® technology (containing only one plugging head instead of two) required a fitting and separate tap for each plugging head. As an improved variant of the original, STOPPLE® Train technology saved a considerable amount of needed work space with its two-in-one design. It would provide double the sealing capability through double block and bleed (DBB) technology with half the fittings. This was well suited to the tight work zone where the job was to be performed.

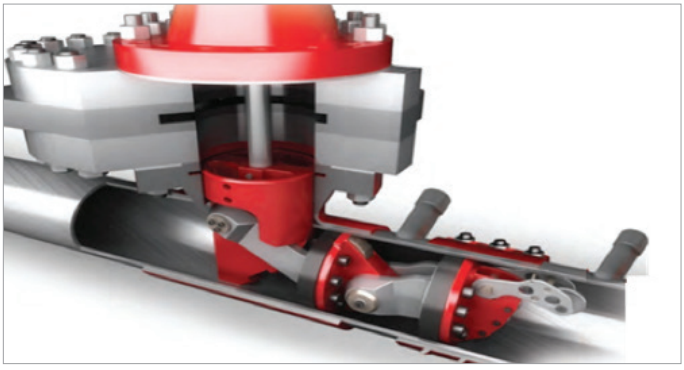

FIGURE 1 DBB ACHIEVED THROUGH SINGLE TAP

Additionally, because of the line's high operating pressure, the STOPPLE® Train isolation's DBB technology ensured a sufficient barrier was in place to hold back pressure while rerouting the line. Once set, the area between the heads would be depressurized through a bleed port. The port would then be left open and monitored so that if any product seeped past the primary seal, it could be removed from the line and captured or evacuated to a safe location. This would create a zone of "zero energy," enabling technicians to redirect flow in a safe work environment.

Pipe Wall Dilemma

The first obstacle to overcome was the atypical thickness of the pipe wall. Current STOPPLE® Train technology, not designed to seal such thick pipe, was not suited to perform the isolation without major adjustments. Though original STOPPLE® technology (with only one plugging head) would seal against a thicker-walled pipe, it required much more space to perform the isolation and additional fittings the operator specifically wanted to avoid. Determined to finish the job and ensure a safe isolation project, TDW resolved to modify its STOPPLE® Train technology to accommodate the thick pipe wall.

Innovative Redesign

TDW set to work redesigning their STOPPLE® Train technology to accommodate the line's .875-inch pipe wall. Product development engineers and commercial experts collaborated extensively with the project team. After modification and exhaustive testing procedures under both flow and pressure, the modified STOPPLE® Train was ready to go.

A final barrier inhibiting the STOPPLE® Train isolation was the interior conditions of the pipe. Because natural gas pipelines are dry, isolation tools experience high levels of friction, which can be damaging to the plugging equipment. TDW utilized the creative and controlled application of lubricants on the interior of the pipe to minimize this friction.

TDW provided a successful monitored, leak-tight isolation against a pressure of 60-bar (875-psi). To maintain flow assurance to the operator's customers, a bypass was put in place that rerouted product through the STOPPLE® Train housing. The isolation remained in place for ten days while the operator tore down the shuttered gas processing plant. After the isolation was complete, two 36-inch LOCK-O-RING® Plus completion plugs were placed on the line.



FIGURE 2 **STOPPLE TRAIN ISOLATION WITH BYPASS THROUGH THE HOUSING**

Successful Completion

TDW leveraged their experience in developing customized responses to create a robust solution for the operator. Departments and teams collaborated to design, build, test and deploy technology within the operator's timeframe and budget. The partnership celebrated many accomplishments. TDW technicians successfully isolated the line on the first attempt. The isolation tools were inserted into and extracted from the pipeline safely and without incident. No product was released through the bleed port. Most importantly, service to customers continued without interruption.

TDW used their wealth of experience to meet the customer in their unique situation. When equipment limitations prevented the job from getting done, the innovative company used their industry expertise to craft a customized solution to ensure uptime and meet their customer's needs.

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