CASE STUDY

Canline pipeline solutions Ltd.

ADVANCED PULLING TECHNOLOGY

PROJECT OVERVIEW

INDUSTRY: Oil and Gas

PROJECT: Tethered Inline Inspection

PROJECT CRITERIA

The client approached Canline in August of 2020, inquiring if it was logistically feasible to execute a unidirectional tethered inspection using Geometry and MFL inspection tools, through three of their extensive pipelines with significant bends.

The client was concerned that the traditional untethered pull approach, utilizing a steel cable, would result in internal damage once the steel cable was pulled back through the bends. They also weren't confident it would be possible to propel (blow down) the inspection tool through this extensive length of pipeline.

PROJECT CHALLENGES

Both the length of the pipelines and the number of bends presented significant challenges to execute this inspection. Traditional tethered inspections can cause internal damage to the pipeline, particularly when there are several bends, as the steel cable can cut slots in the pipeline. Additionally, steel cable is heavy and its weight limits how far a blow down pig or inspection tool can travel, while tethered.

PROJECT SNAPSHOT

One of Canline's longest pulls with the most significant degrees of bends.

TIMELINE OF PROJECT

8 Days On Site

PIPELINE DETAILS

2.01 mile 12" pipeline including 4 bends for a total of 270° (2x 1.5D 45° + 2x 3D 90°).

1.6 mile 12" pipeline including 4 bends for a total of 270° (2x 1.5D 45° + 2x 3D 90°).

0.91 mile 12" pipeline including 4 bends for a total of 560° (2x 1.5D 45° + 5x 3D 90°).

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PROJECT CHALLENGES (cont.)

Typically, this requires cutting and removing the bends to shorten the segments for tethered inspections. This dramatically increases down-time and project costs, due to the number of bell holes required. This approach also comes with significant environmental impacts, as it involves considerable ground disturbance.

This project presented challenges mid-inspection, requiring intervention and the reliance on Canline's expertise to find a solution. During the process, an undetected Pipe Tee was discovered in a line that caused the compressed air to bypass around the blow down pig, preventing it from advancing. The blow down pig was removed and modified with standard spare inventory, carried on all of Canline's Advanced Pulling Technology (APT) units.

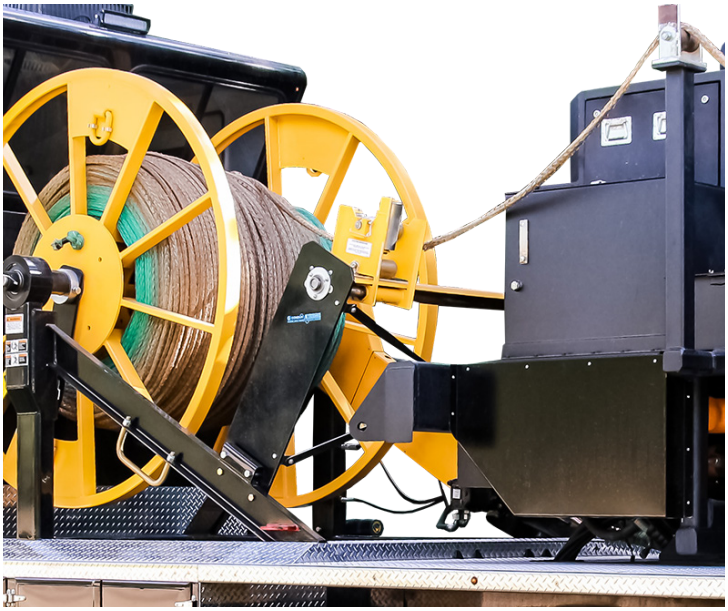
Once modified, the blow down pig was able to traverse the Pipe Tee without further issue. In addition, the radius of some of the bends was less than anticipated, which caused issues with the inspection tool passing through.

This area was also classified as a "high consequence area", requiring proper inspection. With the experience and knowledge of Canline's team and the client's crew, these extremely tight fittings were successfully navigated.

HOW THE CRITERIA WAS MET

Canline Pipeline Solutions' technical team reviewed the pipeline drawings and referenced Canline's 35 years of project data, determining these tethered inspections were feasible. Canline's comprehensive pre-job coordination process involved conducting site inspections and several online meetings with all stakeholders involved in the project, to obtain the appropriate information required to plan and coordinate the project execution. Canline's thorough checklists were instituted to ensure no details were missed.

Canline deployed one of its state-of-the-art Advanced Pulling Technology (APT) units to the site. All APT units are equipped with Real Time Data Acquisition Equipment that monitors and records speed, weight, and distance in a Data Logging Record (DLR). The APT's direct drive hydraulic capstan system, allows for smooth, consistent pulling power, making it far superior to conventional "wire-line" trucks. This unit also features specialized, lightweight, high performance, synthetic rope. It is extremely strong, flexible, and safer than steel cable, which has an incredible amount of stored energy when it is under tension. The use of synthetic, lightweight rope, allows for longer pulls and mitigates the potential for internal damage to the pipeline, especially where there are bends.



Throughout the project there was adherence to Canline's high safety standards. This included defining an exclusion zone to keep people away from operational equipment. Canline's radio procedures were established giving priority radio access to team members monitoring for emergencies. As well, ongoing Job Safety Analysis (JSA) and Job Hazard Analysis (JHA) was conducted.

At the completion of the project, the client received Canline's standard Quality Control Package, inclusive of the real time data collected during the project. This detailed package included job location, date, time, pipeline size, and the electronic run data logs.

The combination of Canline's knowledgeable team of experts, reliable processes and systems, and technology innovations, ensured this client's complex pipeline inspection could be successfully completed. The approach not only provided the client with significant savings, but also ensured the inspection produced the necessary data, while minimizing the environmental impact.