



Case Study

Tailor-Made Turnkey Inline Inspection Project for an Aviation Fuel System

Intero's client awarded Intero a turnkey project located at a military airfield in western Europe. This project included cleaning and inspection of multiple aviation fuel supply pipelines. Due to the variety in pipeline sizes, limited accessibility, and confined spaces, Intero developed a tailor-made solution for a successful inspection - the Push-Pull Surveyor.

Project Scope:

- Temporary modifications
- Cleaning
- Gauging/Proving
- Inspection.

Pipeline Detail:

- Unpiggable
- 2" and 4" Aviation fuel lines
- 19 pipe sections
- Total length of ~1900 meters



The Challenge

Each country recognizes their aviation fuel supply systems to military airfields as critical infrastructure. Any disruption can cause huge economic and strategic defense consequences.

For this project, the pipeline network connected the airfield fuel tanks to fuel hydrants, where the aircraft parked and refueled. The airbase did not construct the fuel supply system for maintenance pigging or inline inspections. As a consequence, very limited space remained available for the installation of pigging equipment. Intero engineered a tailor-made solution for the placement of temporary piping and inspection equipment to support the inspection.

The client presented Intero another major challenge: with critical day-to-day operations of the airfield, they limited Intero's time to rig-up, clean, and inspect the pipelines to very short time windows.

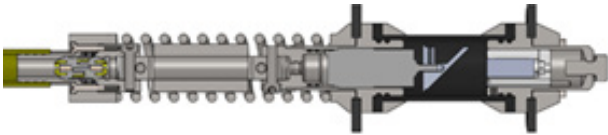
Additionally, the client used two-inch (2") fuel hydrant feed lines to supply the aircraft refueling and parking areas. Inspection technology did not exist for 2" pipelines in this application. Intero needed to design a custom tool for this application.

Our Solution

During Intero's initial application engineering review, the situation was assessed in detail, and Intero developed the Push-Pull Surveyor, a turnkey solution for the inspections of both the 2" and four-inch (4") pipe sections.

Adaptation To Client Needs

To ensure Intero did not interrupt the client's day-to-day airport operations, Intero placed the inspection equipment on a mobile platform. The field engineers could then rig-up or rig-down and relocate in minutes, as needed. Intero also designed special spool pieces to quickly connect the pigging equipment to the pipeline in the limited available space.



In preparation for the inspection, Intero's well-trained team of engineers cleaned the pipeline segments and launched the Intero dummy tool to verify piggability of the pipelines.

Custom Engineering

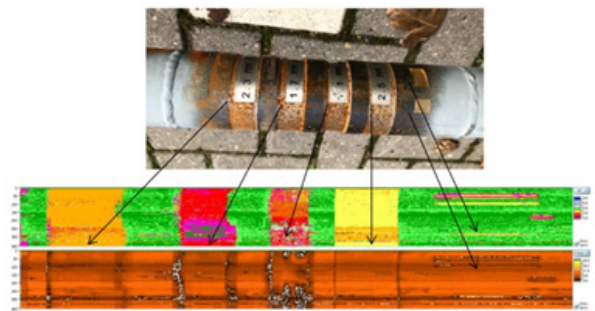
The client's 2" fuel lines from the hydrants connected to the main 4" fuel supply line via tee-pieces. They challenged Intero to not only design the smallest ultrasonic (UT) inspection tool in the market, but also to make it bidirectional. Intero rose to the challenge and its Research and Development (R&D) department designed the customized 2" high resolution UT Push-Pull inline inspection tool.



Using ultra high frequency sound, Intero designed the 2" tool to measure wall thicknesses less than 1 mm, with maximum accuracy. Also, the push-pull umbilical enabled precise control and steering of the inline inspection tool, ensuring accurate measurements and successful navigation through the difficult-to-inspect pipeline segments.

The Result

With close cooperation among the client, Intero's project team, and Intero's R&D department, Intero successfully inspected the client's difficult-to-inspect pipelines within the initial prescribed schedule.



Verification spool for calibration

Advantages

- Customized equipment solution for site specific constraints
- High resolution ultrasonic inspection tools, providing high quality data, enabling accurate decisions
- Custom Designed inspection equipment to meet client system design constraints
- Turnkey solution