



Customer Uses Pressure Wave Technology in Blocked Pipeline

INNERVUE™ PIPESUITE SURVEY ACCURATELY PREDICTS STUCK PIG LOCATION WITHIN 0.4%

THAILAND

CHALLENGE

- » Mandrel pig launched into pipeline but not received, despite unaffected production
- » Non-ideal conditions for InnerVue™ PipeSuite survey due to pipeline flow and pressure fluctuations

SOLUTION

- » InnerVue PipeSuite surveys to profile pipeline and locate stuck mandrel pig and other associated blockages

RESULT

- » Predicted location of the pig within 0.4% of the likely stuck position at a wye piece in the pipeline
- » Provided valuable data for the client to help with decision for retrieval of the stuck pig

OVERVIEW

Halliburton Pipeline and Process Services was contracted to conduct InnerVue™ PipeSuite surveys on a 16-in. crude oil pipeline located 125 miles offshore in the Gulf of Thailand. The objective of the survey operation was to locate the position of a pig mandrel stuck in the pipeline.



Surveys were carried out using the production fluid, without the need for production shutdown or line displacement. Rapid closure of a manual valve allowed generating of the pulse. The pressure was then measured on a high-resolution pressure transducer and recorded on a data logger. This was repeated several times from both ends, taking about four days for a single InnerVue PipeSuite diagnostics field engineer to complete, along with assistance of the Chevron production team. The main risks were a high or low level of the LP separator and a high pressure of the pipeline. Performing a risk assessment and maintaining communication between the respective crews accounted for successful performance of the job without incident.

PROJECT DETAILS

Using two InnerVue PipeSuite survey kits, a high fidelity and ultra-high-resolution pressure transducer was connected to a ¾-in. tie-in point onboard each platform at the pig trap. All the data sets showed that the tool covered a significant part of the pipe cross-sectional area, which was consistent with the size of the mandrel pig. Further findings revealed no significant waxy deposit (only 1 mm) between the pig mandrel and the receipt platform. Between the launch platform and the pig mandrel, however, the data sets were too noisy to make any assessment.

CONCLUSION

Ultimately, the lost mandrel tool was detected at 2,280 m +/- 62 m downstream from the the launch platform. This position corresponded approximately to the position of a wye installed a few years previously for future projects.

In addition to the delivery of detailed blockage assessments, Halliburton offered its client a full suite of services for the mechanical and/or chemical cleaning of partially blocked pipelines, such as the surveyed crude oil pipeline.

DID YOU KNOW

The InnerVue PipeSuite diagnostics service is a low risk, fast and accurate technique used to map the quantity and distribution of what may be limiting the throughput of the pipeline system, such as wax, hydrate, stuck pig or tool. A pressure wave is created at one end of the pipeline and travels through its entire length at the speed of sound. A reflected signature wave is returned, which corresponds to actual conditions within the pipeline, including:

- » Changes in flow velocity from deposits/debris
- » Changes in medium properties, such as density, viscosity and phase

Analysis of critical data collected by the “pressure wave” technology will increase your understanding of a given pipeline transportation system—from end to end—and provide valuable insight for decisive asset performance management. The InnerVue PipeSuite diagnostics service locates pipeline blockages to high accuracies within 0.3% of pipeline length.

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