Thums Subsea Pipelines

Original Pipelines installed in 1966
Oil, Gas and Water (J-lines) Pipelines
Thums Subsea Pipelines

- **8 Subsea Pipelines Transport Oil and Gas to Pier J**
  - Steel Lines
  - 6”, 8”, 12” and 14” lines
  - Water cut in Oil Pipeline ranges from 5% to 70%

- **4 “J-lines” Transport Water from Pier J to the Islands for Re-injection**
  - Internally cement Coated Lines
  - 12”, 14” and 18” lines
  - Produced water (5ppm oil)
Oil & Gas Pipeline Mechanical Integrity

- DOT Regulated
- Monitoring Program (Inspection Surveys)
- Cathodic Protection
- Chemical Inhibition
- Pipeline Cleaning Program (Pigging)
J-Line Mechanical Integrity Program

- Cathodic Protection Surveys
- Corrosion Inhibition
- Pressure Testing
- Internal Inspection Survey
J-Line: CP Over-the-line Survey

- Generate a potential profile along the entire Pipeline Length
  - Test connection to the pipeline is onshore
  - A silver/silver chloride reference electrode is towed above the pipeline
  - Test connection is Maintained to the pipe by spooling out a light gauge insulated wire

- The pipe-to-electrolyte potential is measured
  - The polarized potential of the pipeline is measured by cycling rectifiers "ON" and "OFF"
J-Line : CP Over-the-line Survey

BUNDLE vs GJ1 (QM TO G)

-850

Potentials

Pipeline Length (RUN #)

115 151 272 428 583 752 953 1133 1326 1536 1735 1936 2135 2339 2540 2751 2952 3167 3380 3594 3807 3998 4045
J-Line: Chemical Corrosion Inhibition

- Heavy residual inhibitor concentrations from Islands

- Pipelines also Treated Continuously with small dosage of Corrosion Inhibitor

- Corrosion coupons analyzed to track deposit build-up that may affect Water Quality
J-Line: Video Inspection Survey

- Pipeline is Internally Cement Coated
- Pipelines not able to use UT Smart Pig or MFL Technology
- Video Camera Technology will allow documented visual internal inspections
Determined that Tethered Crawler Video Camera would be used (Fiber optics, zoom lens)

Ability to Move Camera back/forward

Able to pull equipment out if stuck

Camera allows for magnification of Corrosion areas or other anomalies
J-Line: Pipeline Video Survey

• Use of Crawler required installation of Pig Launchers / Receivers

• 2007/2008 Installed Launchers / Receivers
  • Allow for Cleaning of the Pipelines
  • Access for the Inspection Tool

• Project Cost was approx $2.1MM
J-Line: Pipeline Video Survey
J-Line: Pipeline Video Survey
J-Line: Pipeline Video Survey
J-Line: Pipeline Video Survey
J-Line: Pipeline Video Survey
J-Line: Pipeline Video Survey

- Lines were Pigged to remove solids
- 5 & 8 lb Foam pigs were used
J-Line : Pipeline Video Survey

- Initial Survey was in Water
- Lines then pigged to Nitrogen for Better Clarity

**Crawler Survey distance inhibited by**
- Condensation in Pipelines
- Friction from the Tether line

- **Problems with Crawler Orientation due to Piping Bends**
J-Line : Video Survey

Launcher / Receiver

Piping Bends
Thums JL-1 Pipeline Video Survey
Surveyed 70% of the J-lines
J-Line : Video Survey Summary

- Good Visual of the Pipeline Condition
- Internal Cement coating appears to be in good condition
- Good Weld Integrity
- Successful Hydrotest
Thums JL-1 Pipeline Video Survey

VIDEO_TS\VTS_01_1.VOB

Jlinempeg1.mpg  Jlinempeg2.mpg
J-Line Integrity Plan Forward

- Improve the Quality of Inspections for the Internally Cement Lined Pipelines
  - Investigate use of a “Modified” MFL tool
  - Investigate use of a Tethered Eddy Current Inspection (SLOFEC)
  - Continue to investigate other Inspection Technologies
Questions?