

## **Extract from SwRI\_1<sup>st</sup>\_QR\_December2005\_DTRS56\_04\_T\_0001**

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### **Public Page (Abstract)**

The objectives of the work are to:

- Increase pipeline safety by characterizing strain anomalies in pipes due to gouged dents in terms of the time-evolution of nonlinear harmonic (NLH) signals;
- Formulate NLH-based defect severity criteria for the remaining lives of mechanically damaged pipelines that can be used in assessing delayed failures;
- Enable NLH technology to be transferred to in-line inspection (ILI) companies through collaboration between SwRI and Tuboscope Inspection Services in developing guidelines and software for implementing the NLH-based criteria.

The intent of the program is to:

- Investigate the capabilities of the NLH method to detect simulated stress corrosion cracking by subjecting the EDM notched pipe sample to various static pressures while inspecting the inside of the sample with a NLH scanner to detect the strain anomalies on the inside surface of the pipe produced by the notches;
- Use NLH scanners to periodically monitor the development of strain anomalies on the inside of the four gouged pipe samples due to the accumulation of fatigue damage from cyclic pressure changes.

Accomplishments include the procurement and fabrication of gouged dents of various levels of severity in each of four pipe samples, and the manufacture of fifty electric-discharged machined (EDM) notches in another pipe sample. Pressure test facilities have been setup and four NLH probes and scanners have been designed and fabricated.