

**SOUTHWEST RESEARCH INSTITUTE®  
SUMMARY STATUS FOR PROJECT NO. 14.06172  
AGREEMENT DTRS56-02-T-0003**

**“FEASIBILITY OF IN-LINE STRESS MEASUREMENT BY CONTINUOUS  
BARKHAUSEN METHOD”**

**STATUS OF WORK THROUGH MARCH 31, 2003**

This 18-month project relates to the problem of mechanical damage, hard spots, and other stress anomalies in a pipeline. Current in-line inspection (ILI) systems using magnetic flux leakage (MFL) or ultrasonic methods to inspect pipelines for corrosion or cracks are not sensitive to regions of anomalous stress on the pipewall. The Continuous Barkhausen Noise (CBN) method, whose feasibility is being evaluated in this project, has been shown in earlier SwRI work to detect such regions.

This project was designed to determine if CBN can be implemented on an existing MFL inspection pig by taking advantage of the fact that there are convenient transition regions in the magnetic flux around the pig. These transition regions are potential sensing areas for CBN. The project will study the magnetic fields, design CBN sensors, and ultimately test them with pull rig and field pig operation.

To date, Task 1: Determine Optimum Sensor Location, and Task 2: Determine Optimum Sensor Design, have been accomplished. In Task 1, Rosen GmbH, our commercial partner in the project, has supplied us with detailed data describing the magnetic field distribution around one of their MFL pigs. These data were used in the finite element routines to identify potential sensing locations. The locations were confirmed experimentally. The sensor was designed and experimentally validated in Task 2.

Although the start of the project was delayed by efforts to establish the cofunding arrangements and subcontracts and by normal work delays at the end of the calendar year, these delays are not expected to impact the forecast of progress by the second quarter of calendar 2003.

**Point of Contact**

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