The contract includes two major tasks during the base two years of the contract, and one major task (Task 3) being considered for an option year to the contract:

- Task 1 is to evaluate existing MFL signal generation and analysis methods to establish a baseline from which today's tools can be evaluated and tomorrow's advances measured. Then, it will develop improvements to signal analysis methods and verify them through testing under realistic pipeline conditions. Finally, it will build an experience base and defect sets to generalize the results from individual tools and analysis methods to the full range of practical applications.

- Task 2 is to evaluate two inspection technologies for detecting stress corrosion cracks. The focus in Task 2 is on electromagnetic techniques that have been developed in recent years and that could be used on or as a modification to existing MFL tools. Three subtasks will evaluate velocity-induced remote-field techniques, remote-field eddy-current techniques, and external techniques for sizing stress corrosion cracks.

- Task 3, if done, will verify the results from Tasks 1 and 2 by tests under realistic pipeline conditions. Task 3 will (1) extend the mechanical damage detection, signal decoupling, and sizing technology developed in the basic program to include the effects of pressure, (2) verify the algorithms under pressurized conditions in GRI's 4,700 foot, 24-inch diameter Pipeline Simulation Facility (PSF) flow loop, and (3) evaluate the use of eddy-current techniques for characterizing cold working within mechanical damage.

A drawback of present pig technology is the lack of a reliable pig performance verification procedure that is generally accepted by the pipeline industry and RSPA. The experience gained by the pipeline industry and RSPA with the use of the PSF flow loop in this project will provide a framework to develop procedures for evaluating pig performance. Defect detection reliability is critical if instrumented pigs is to be used as an in-line inspection tool in pipeline industry risk management programs.

The ultimate benefits of the project could be more efficient and cost-effective operations, maintenance programs to monitor and enhance the safety of gas transmission and hazardous liquid pipelines. Pipeline companies will benefit from having access to inspection technologies for detecting critical mechanical damage and stress-corrosion cracks. Inspection tool vendors will benefit by understanding where improvements are beneficial and needed. These benefits will support RSPA's long-range objective of ensuring the safety and reliability of the gas transmission and hazardous liquid pipeline infrastructure.

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