QUARTERLY REPORT

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Project Title: **A Comprehensive Update in the Evaluation of Pipeline Weld Defects**

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A Comprehensive Update in the Evaluation of Pipeline Weld Defects

Summary

Girth weld defect acceptance criteria are set and enforced in all pipeline constructions in the U.S. per federal regulations (CFR 49 Parts 192 and 195). With the increased use of mechanized welding and AUT (Automated Ultrasonic Testing) in new pipeline constructions, alternative defect acceptance criteria based on ECA (Engineering Critical Assessment) principles are frequently used in lieu of the traditional workmanship criteria. The objective of this project is to provide technical basis towards a major update to the alternative girth weld defect acceptance criteria. There are two focus areas in this project. The first focus area is to update the alternative defect acceptance criteria to address the immediate need of the majority of onshore pipeline constructions in the U.S., typically with pipeline longitudinal strains less than 0.5%. The second focus area is the development of alternative defect acceptance criteria for pipelines in geotechnically challenging environments, such as arctic area and deep water offshore, alternatively termed strain-based design. No codified defect acceptance criteria yet exist for such service conditions. It is expected that the outcome of this project will form the technical basis for the revision of girth weld alternative acceptance criteria in North America, such as API 1104 Appendix A and CSA Z662 Appendix K.

Progress of the Project

The major accomplishment to date is the production of the girth weld defect assessment procedures for stress-based design, i.e., pipelines with longitudinal strains less than 0.5%. This is the key deliverable of the first focus area. To facilitate code-making process, a self-contained separate report was completed and distributed to DOT, PRCI, and API 1104 committee. The report covers (1) technical basis for the development of the revised girth weld defect acceptance criteria, (2) validation of the acceptance criteria against experimental test data, and (3) recommended structure for the revision of API 1104 Appendix A.

A public review meeting that covered the major outcome of the first focus area was held in Houston on October 13, 2004. The meeting was well attended by 33 representatives from the energy industry, PRCI member companies, and DOT. The minutes of the meeting and the viewgraphs were distributed to the meeting participants, DOT, and PRCI members.

The results of the first focus area were presented to API 1104 committee in January 2005. The work was well received. API 1104 now has a schedule to redraft API 1104 Appendix A based largely on the work of this project.

The focus of the project team is now on the second focus area, i.e., the development of girth weld defect acceptance criteria for strain-based design. After some delays, the test materials were secured. A number of laboratory-sized low-constraint specimens have been tested. Two trial structural specimens in the form of mini-wide plates have been successfully fabricated. This represents a major accomplishment of the project as design and precise fabrication of such large specimens is often difficult. The next step involves testing of these trial specimens. Upon successful testing of those trial specimens, full production of the remaining structural specimens will begin.