

10.0 PUBLIC PAGE

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 in the First Year of the Project

The major accomplishment in the first year of the project 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 represents the central deliverables of the first focus area. To aid the transfer of this technology to the relevant code committees, a self-contained separate report has been drafted. The report has been distributed to DOT and PRCI project managers for review. 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 covers 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 are to be distributed as separate documents to the meeting participants.

With the completion of the major work in the first focus area, the attention 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. Within this focus area, a significant amount of experimental work is planned as prior existing test data often do not cover girth weld behavior under high longitudinal strain conditions. The work is under way to test three types of modern girth