



U.S. Department
of Transportation

ASSESSMENT & VALIDATION OF TFI-IDENTIFIED ANOMALIES, CRITERIA FOR REPAIR AND AVAILABLE REPAIR METHODS

OPS ACCOMPLISHMENTS

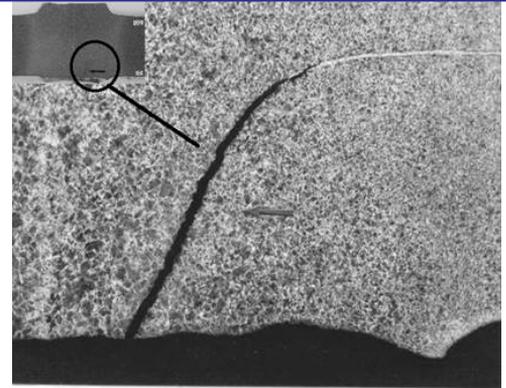
Pipeline Safety
Research and
Development
for Enhanced
Operations,
Controls, &
Monitoring

Challenge

Seam weld defects are one of the integrity threats considered by pipeline operators in the development of integrity management plans. In particular, some early-generation seam welds (e.g., prior to about 1970) can be more susceptible to failures because of poor mechanical properties (e.g., low toughness) that result in relatively small tolerable defect sizes (depth and length). Emerging in-line inspection (ILI) technologies, including the transverse flux inspection (TFI) tool, are used by pipeline operators to identify seam weld defects. However, the interpretation of results provided by ILI vendors and assessment of defects in the field can be difficult.

Accomplishments

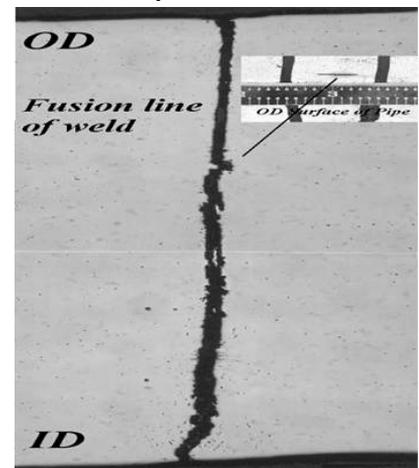
CC Technologies has progressed by identifying and acquiring samples of seam welds that contain a variety of defects. CC Technologies has also identified in-house material property data for various seam welds containing different defect types. Information and data obtained from metallographic examinations, burst tests, full-scale pressure cycle tests, and field non-destructive examination results have been identified. The compilation of this information and data will soon be complete and an evaluation of the data will commence.



Example of Hook Crack Connected to ID Surface in Flash Weld

Technology Description

The objectives of the project are to (1) compile a catalog of seam weld defect types and (2) develop methods for evaluating seam weld defects to determine whether pipeline integrity has been compromised.



Example of Through-Wall Lack of Fusion Defect in Electric Resistance Weld

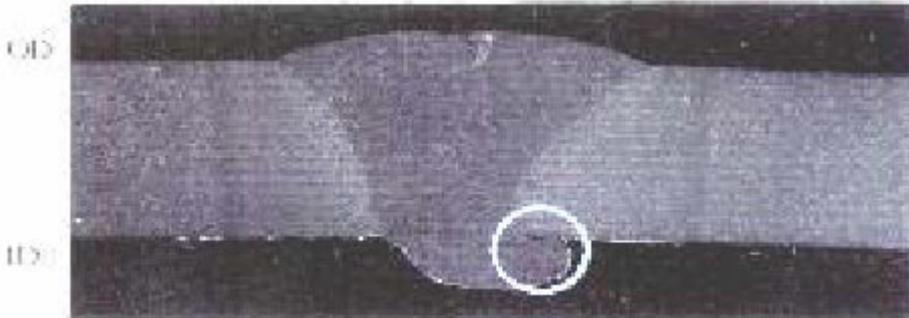
Contact

James Merritt
R&D Program Manager
(303) 683-3117 office
(303) 638-4758 mobile
(303) 346-9192 fax

James.Merritt@rspa.dot.gov

Office of Pipeline Safety

Research & Special Programs Administration



Example of Excessive Root Penetration in Single Submerged Arc Weld (SSAW)

Benefits

The work will provide an understanding of the types of defects and mechanical properties of early generation seam welds, and will describe methods for evaluating the severity of seam weld defects. The results will expand the options to use emerging ILI technologies to characterize seam weld defects.

Future Activities

Future work consists of the compilation and evaluation of unique properties of early-generation pipeline seam welds, compilation of a catalog of defect types, the development of methods for evaluating seam weld defects to determine whether pipeline integrity has been compromised, and options for repair. The deliverables on this project are a catalog of defect types and a protocol describing how to evaluate seam weld defects. The results from this project will likely require validation through further assessment and/or full-scale testing.

Partners in Success

- ◆ CC Technologies Services, Inc. Dublin, OH www.cctechnologies.com
- ◆ Pipeline Research Council International, Inc. (PRCI) www.prci.com



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