



ALLIED

CORROSION INDUSTRIES INC.

STRESS CORROSION CRACKING DIRECT ASSESSMENT

STRESS CORROSION CRACKING DIRECT ASSESSMENT (SCCDA)

An intricate part of Pipeline Integrity Management (PIM) is the verification that Stress Corrosion Cracking does not exist on your transmission pipeline system. Our field-proven pipeline Direct Assessment specialists effectively combine the SCCDA process in with other DA Standard Practices providing a complete and cost effective PIM program.

ACI has assembled an experience staff of proven Direct Assessment professionals, along with investing in state-of-the-art equipment required to identify and assess potential stress corrosion cracking locations along transmission pipelines. Our DA staff consists of NACE certified Corrosion Specialists, Cathodic Protection Specialists and Cathodic Protection Technicians.

What is SCCDA?

As defined in the NACE Standard RP0204-2004, Stress Corrosion Cracking (SCC) is the cracking of material produced by the combined action of corrosion and tensile stress (residual or applied). SCC Direct Assessment Methodology is a procedure that can identify areas where either near-neutral-pH SCC or high-pH SCC can occur on external pipe surfaces. The SCCDA process consists of four Steps:

- **Pre-Assessment**
- **Indirect Inspection**
- **Direct Examination**
- **Post Assessment**



PRE-ASSESSMENT

In the Pre-Assessment step, ACI's or the owner/operator's personnel will collect historical and current data for the purposes of analyzing and prioritizing the threat of SCC. Prioritization of SCC susceptible pipeline segments is performed utilizing the following factors:

High-pH SCC

- Operating Stress exceeds 60% of SMYS
- Operating temperature exceeds 100 F (38 C)
- Within 20 miles of a compressor station
- Age greater than or equal to 10 years
- Coating type other than Fusion Boded

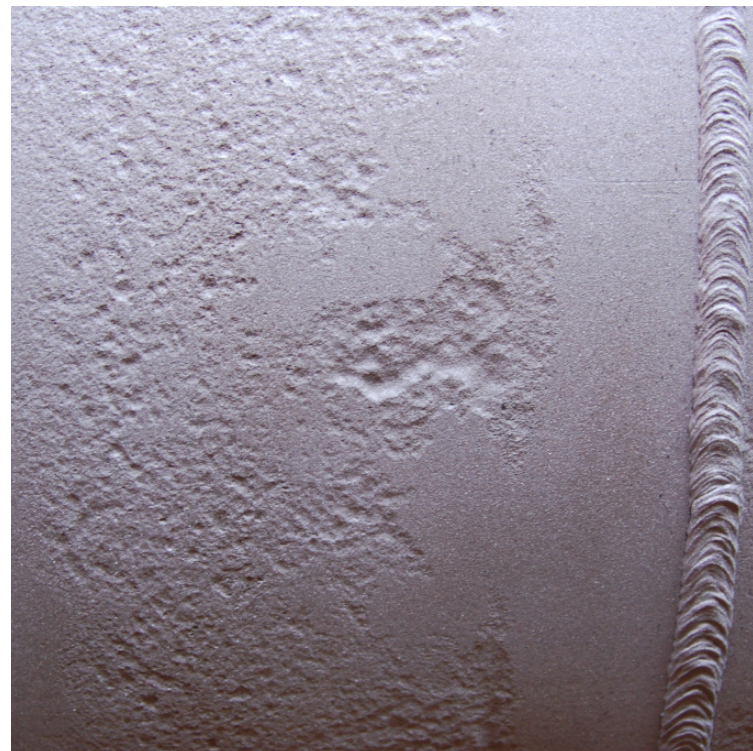
Epoxy

Near-Neutral-pH SCC

- Same factors as above with the exclusion of temperature.

INDIRECT INSPECTION

The purpose of the Indirect Inspection step is to collect additional information that was not available in the owner/operator's historical records. Some of the data that ACI could collect in this step would included data from Close Interval Surveys (CIS), Direct Current Voltage Gradient (DCVG) surveys, and terrain conditions (soil type, topography, and drainage) along the right-of-way (ROW) in which the pipeline is located. Once all of this information is assembled, the direct examination site list is finalized and prioritized.



DIRECT EXAMINATION

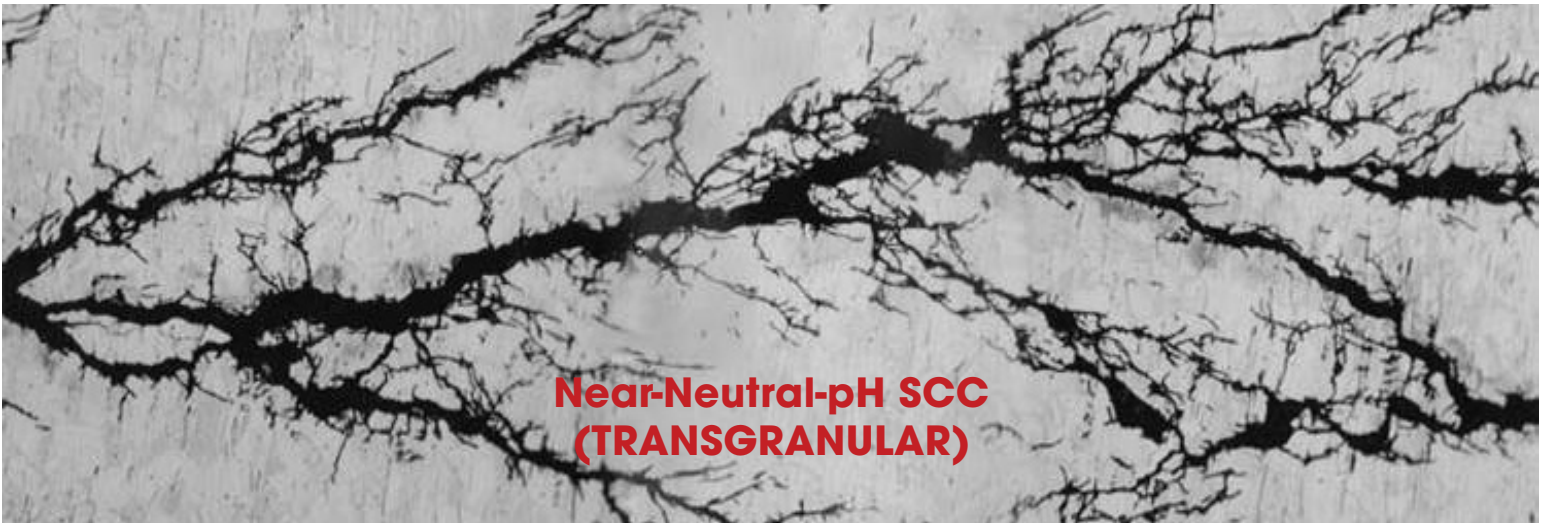
The purpose of the Direct Examination step is two fold. First, this step will either validate or nullify the decision criteria for SCC direct examination site selection. Second, this step provides for the actual digging of the suspected SCC locations for inspection. When performed, these dig sites will render the severity, extent and type of SCC (intergranular or transgranular cracking). This information is crucial in the post assessment process in order to develop a predictive model and allow for modifications. A wide range of related physical data is collected, along with Magnetic Particle Inspection (MPI) of the susceptible area. NACE Standard RP0204-2004 outlines four different MPI techniques for inspecting the external surface of pipelines. They are:

DPMPI – Dry Powder MPI: The ultimate sensitivity of this inspection technique is 2 to 5 mm long defects.

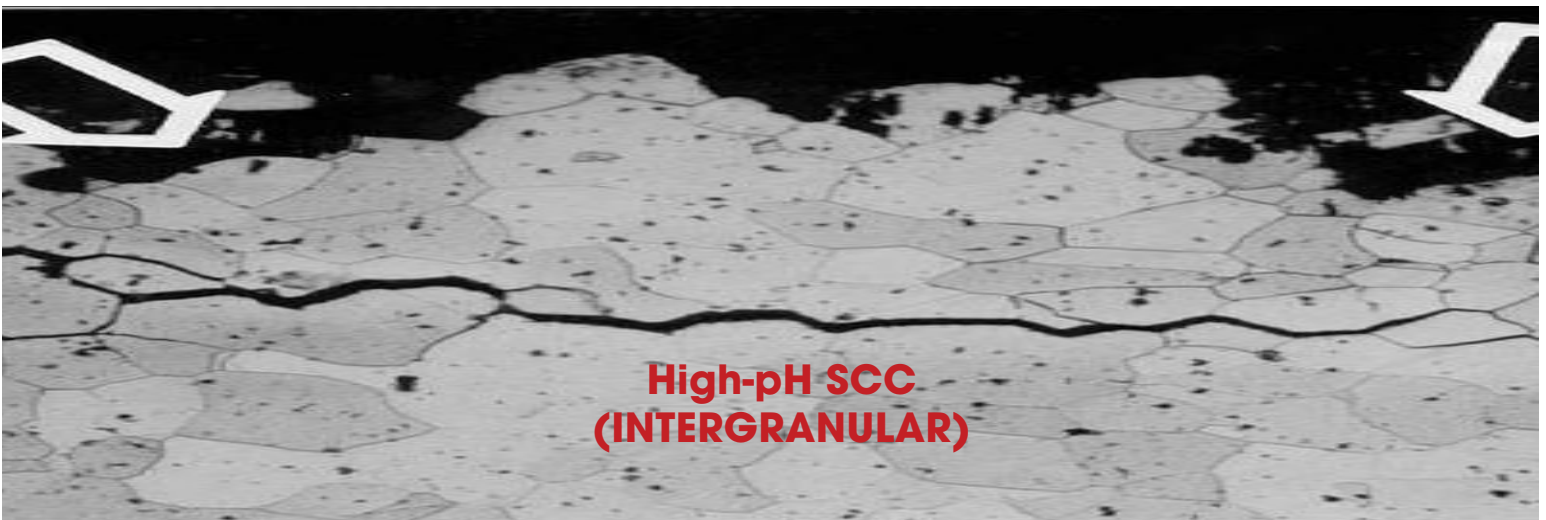
WFMPI – Wet Fluorescent MPI: The ultimate sensitivity of this inspection technique is 1 mm long defects.

WVMP – Wet Visual MPI: The ultimate sensitivity of this inspection technique is 1 to 2 mm long defects.

BWMP – Black on White MPI: The ultimate sensitivity of this inspection technique is 1 to 2 mm long defects. This technique is preferred over the others due to the ease of photographic



**Near-Neutral-pH SCC
(TRANSGRANULAR)**



**High-pH SCC
(INTERGRANULAR)**

POST ASSESSMENT

In the Post Assessment step, ACI or the owner/operator will analyze the data collected from the previous three SCCDA steps for the following purposes:

- To determine if SCC mitigation is required and if so, prioritize those actions.
- To define the time interval to re-assess the pipeline segment.
- To evaluate and verify the decision model used to find SCC.

Our Integrity Management Team is ready to provide turnkey SCCDA services or we can perform any single or multiple step(s) that you, the owner/operator require.



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