

SUPPLEMENTAL SCC QUESTIONNAIRE
GAS TRANSMISSION OR LIQUID PIPELINE

1. Pipeline Safety Advisory Bulletin - ADB-03-05 - October 8, 2003
 - Review Bulletin with operator, if operator is not familiar with.
 - Reference also Baker Stress Corrosion Cracking Study at:
http://primis.phmsa.dot.gov/gasimp/docs/SCC_Report-Final_Report_with_Database.pdf

Comments: **Operator was aware of study and ADB from 2014 IMP inspection**

2. Has the pipeline system ever experienced SCC (in service, out of service, leak, non-leak)?
 - Type of SCC?
 - Classical - high pH
 - Non-classical – low or near neutral pH
 - What are the known risk indicators that may have contributed to the SCC?

Comments: **Operator has not experienced SCC**

3. Does the operator have a written program in place to evaluate the pipeline system for the presence of SCC? If no, have operator explain. If operator has not considered SCC as a possible safety risk, go to #10.

Comments: **Added language to IMP manual as a result of 2014 IMP inspection. Operator needs a more robust program to ensure SCC is not an issue. They have implemented process to check for SCC each time line is exposed. Have 5 data points as of this inspection (see question 4. Below)**

4. Has/does the operator evaluate the pipeline system for the presence of SCC risk indicators?

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Comments: Yes, whenever pipelines are exposed as follows:

1. Tidewater has instituted a policy that whenever pipeline is exposed an evaluation will be conducted for SCC conditions (typically black on white magnetic particle testing). To date Tidewater has conducted five evaluations on four different pipelines with no results (Installation dates ranging from 1983 to 2000). To date no indications of SCC were found.
2. Tidewater will add this policy of evaluation to section 1.6 of the Integrity Management Program as well as our Exposed Pipe Inspection Procedure (located in Appendix SOOC of the Pipeline Operations and Maintenance Manual)
3. Using the results of the evaluation , as well as other information, Tidewater will re-evaluate the risk of SCC as part of its annual risk assessment as part of the continuing evaluation and assessment.

5. Has the operator identified pipeline segments that are susceptible to SCC?

Comments: No segments identified

6. If conditions for SCC are present, are written inspection, examination and evaluation procedures in place?

Comments: Conditions for SCC do not appear to be present, but Tidewater does have written procedures for evaluation in place.

7. Does the operator have written remediation measures in place for addressing SCC when discovered?

Comments: Not yet as have not found SCC.

8. What preventive measures has the operator taken to prevent recurrence of SCC?
- Modeling?
 - Crack growth rate?
 - Comparing pipe/environ./cp data vs. established factors?
 - Other?
 - Hydrotest program?
 - Intelligent pigging program?
 - Pipe re-coating?

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- Operational changes?
- Inspection program?
- Other?

Comments: **N/A-No SCC found**

9. Does the operator incorporate the risk assessment of SCC into a comprehensive risk management program?

Comments: **No, operator is collecting data during pipeline excavations to determine if SCC is a risk.**

Continue below for those operators who have not considered SCC as a possible safety risk.

10. Does the operator know of pipeline and right of way conditions that would match the risk indicators for either classical or non-classical SCC? See typical risk indicators below.

Comments: **Tidewater is collecting data to determine if SCC is an actual risk on the pipeline including characteristics as noted below.**

High pH SCC Potential Risk Indicators

- Known SCC history (failure, non-failure, in service, and during testing)
- Pipeline and Coating Characteristics
- Steel grades X-52, X-60, X-65, X-70, and possibly X-42
 - Age \geq 10 years
 - Operating stress > 60% SMYS
 - Pipe temperature >100 deg. F (typically < 20 miles d/s of compression)
 - Damaged pipe coating
- Soil Characteristics
 - Soil pH range: 8.5 to 11
 - Alkaline carbonate/bicarbonate solution in the soil
 - Elevated soil temperature contributing to elevated pipe temperature
- Polarized cathodic potential range: -600 to -750 mV, Cu/CuSO₄

Low or Near-Neutral pH SCC Potential Risk Indicators

- Known SCC history (failure, non-failure, in service, and during testing)
- Pipeline and Coating Characteristics
- Steel grades X-52, X-60, X-65, X-70, and possibly X-42

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- Age \geq 10 years
- Frequently associated with metallurgical features, such as mechanical damage, longitudinal seams, etc.
- Protective coatings that may be susceptible to disbondment
 - Any coating **other than** correctly applied fusion bonded epoxy, field applied epoxies, or coal tar urethane . . .
 - Coal tar
 - Asphalt enamels
 - Tapes
 - Others
- Soil Characteristics
 - Soil pH range: 4 to 8
 - Dissolved CO₂ and carbonate chemicals present in soil
 - Organic decay
 - Soil leaching (in rice fields, for example)
- “Normal” cathodic protection readings (disbonded coating shields the pipe from cp current)