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: KB Pipeline has reviewed ADB-03-05 and does not consider itself to be susceptible to SCC based on the risk factors as listed after question 10 on this questionnaire.

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: No

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: No plan in place specific to SCC beyond required inspections for internal and external corrosion. Absence of a specific plan is based on not meeting the risk factors as listed after question 10 on this questionnaire.

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

Comments: Yes.

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

Comments: The entire pipeline is not susceptible to SCC.

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

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Comments: N/A

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

Comments: No.

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?
    - Operational changes?
    - Inspection program?
    - Other?

Comments: None.

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

Comments: KB caries internal and external inspection whenever pipe becomes available to inspect. Latest anomaly investigations have incorporated magnetic particle inspection as part of the evaluation. No indication of SCC has been found.

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.

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Comments: KB Pipeline is aware of the risk factors listed below and does not consider itself a risk to SCC based on the following;

1. No history of SCC
2. Use of FBE coating
3. Pipe temperature less than 100 deg. F (no compression)
4. Polarized potential outside of the indicated rage

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 ≥ 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, $Cu/CuSO_4$

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
    - Age ≥ 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 CO_2 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)