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:
TransCanada is well aware of the SCC threat to pipelines. TransCanada has identified SCC as a threat of concern to the GTN pipelines.

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

Comments:
From discussion with GTN operational staff, there has not been any reported occurrence of SCC. The GTN A-Line is at risk as per ASME B311.8S (age of pipe > 10 years, operating stress > 60%, coating other than FBE, etc.

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:
TransCanada is currently finalizing a SCCDA Plan which will be forwarded to PHMSA upon completion.

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

Comments:
Yes, TransCanada completed a risk assessment of the entire pipeline system, not just the HCA's.

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

Comments:
Yes, mostly on the A-Line has been identified as SCC susceptible.

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

Comments:
TransCanada is finalizing a SCCDA plan which will cover the procedures referenced in question 3, above.

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

Comments:
Yes, TransCanada has a procedure, 'Repair of Pipeline Defects and Imperfections'.

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:
TransCanada is about to being quantify the SCC threats on the A-Line. Plans are in place to complete the SCCDA plan which will ultimately result in inspections at susceptible sites.

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

Comments:
TransCanada utilizes a quantitative risk assessment process (PRIME) to model the threat of SCC.

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:
Yes, the SCCDA plan includes reference to these risk indicators. As indicated, above, the A-Line is recognized as a threat of SCC.

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)