

## 12th Quarterly Report – Public Page

Date of Report: *May 3, 2011*

Contract Number: *DTPH56-08-T-000003*

Prepared for: *DOT and Co-funders (PRCI and CenterPoint Energy)*

Project Title: *Development of Tools to Estimate Actual Corrosion Growth Rates (Internal and External) of Gas Pipelines*

Prepared by: *Southwest Research Institute*

Contact Information: Frank Song, phone: (210) 522-3988, email: fsong@swri.org

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### **Public Page Section:**

*Model computations and summary of the computational results were made. Several important findings pertaining to practical application of the model to field use have been summarized.*

### **Results and Conclusions:**

*One important finding is that CP shielding coating may not be as bad as people tend to believe. When adequate CP is applied, the so-called “shielding” coating may still be sufficient to provide necessary protection. At the holiday where the pipe surface is directly exposed and corrosion is most likely, CP is effective and the exposed pipe surface is protected. Inside the coating disbonded region where CP current may not reach as commonly believed, the coating may still serve as a barrier to prevent corrosive species in soils from passing through. In addition, the CP applied at the holiday can raise the pH to alkaline inside the disbonded region, and thus, the local corrosion rate may not be significant. There is abundant experimental evidence and field experience that provides proof to the above result. When corrosion happens in coating disbonded regions, it is likely that CP is inadequate and the soil solution is corrosive. MIC and interferences can also be likely the causes.*

*When a coating is permeable, it is found that the CP current which passes through the coating can be sufficient to reduce all O<sub>2</sub> that penetrates through the coating from the soil. Thus, for a permeable coating, the CP can still be effective to protect corrosion in a coating disbonded region. The effect of CO<sub>2</sub> penetration through a permeable coating may have a great effect, which needs to be determined.*

*We have used a scaling method to simplify the complex model. The theoretical background of the scaling method and verification of the scaling method with model results have been summarized as part of the draft final report.*

**Plans for Future Activity:**

*Prepare the draft final report while continuing to summarize the model results. Prepare a paper for the NACE/2012 conference in Utah next March.*