

## Quarterly Report – Public Page

**Report Date:** July 31, 2008

**Contract Number:** DTPH56-08-T-000001

**Project Title:** Development of a Commercial Model to Predict Stress Corrosion Crack Growth Rates in Operating Pipelines, #324

**Prepared for:** U.S.DOT Pipeline Hazardous Materials Safety Administration

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### Progress to Date:

Stress corrosion cracking (SCC) in pipelines is a complex failure mode for both gas and liquid pipelines. It occurs under two broad conditions: alkaline pH and near-neutral pH. As many existing gas and liquid pipelines approach the end of their design life, pipeline operating companies are looking for ways of extending lives of these pipelines through detection and prediction.

Crack growth rate (CGR) determines the remaining life of a pipeline section containing SCC. Thus, a confident prediction of relative CGRs along a pipeline is very useful in prioritizing SCC locations along that pipeline. CGR is also a significant parameter in determining re-assessment interval for SCC direct assessment, and re-inspection interval for hydrotests or inline inspection.

Since the current methods of estimating CGR in the pipeline industry are fraught with significant uncertainties, this program was proposed to estimate CGR more confidently through the use of a physics-based model.

SwRI has developed a theoretical CGR model for high pH SCC in a recently completed program sponsored internally. A further survey and review of literature in this quarter was focused on near-neutral pH SCC. The survey has found expressions that can be used to incorporate into the current model with the effect of hydrogen. Fundamental equations are being developed to model near-neutral pH SCC.