

1st Quarterly Report to the
Office of Pipeline Safety, US Dept. of Transportation
Interagency Agreement DTRS56-04-X-0025
April 30, 2004 as Modified August 4, 2004

Task Order #01
External Corrosion of Line Pipe Steels
For the Quarter ending
July 31, 2004

1. Progress, Findings, and Activities:

- a) Task 1 Kick off meeting –Completed May 19, 2004
- b) Task 2 Literature Review
The main objective of this task was to conduct pipeline literature surveys using computerized literature databases available through the NIST virtual library. The databases searched included CSA Metadex, CSA Corrosion Abstracts, and the Web of Science. In addition, database of a NIST staff member (RER) along with NACE web site database were searched for relevant books, papers, and meetings. Approximately 200 documents were identified as potentially relevant and three books were purchased from NACE per the recommendations of the PRCI corrosion committee. These documents are being studied and will lead to the formation of a sound knowledge base for the staff working on this project.
- c) Task 3 Collation of Corrosion rate data
As part of this activity, NIST provided consultation and advice to DoE/INEEL staff working on their underground corrosion program to retrieve samples buried by NIST in the 1970s.
- d) Task 4 Gap analysis and path forward
While NIST has extensive experience in laboratory corrosion testing methods, testing and evaluation of the existing equipment was required to determine equipment, consumables, and software updates needed for this program. To evaluate the performance of electrochemical apparatus, electrochemical experiments were performed on samples of pearlitic steel provided by the NIST NCNR research staff. These samples are part of a study being conducted by NCNR into the measurement of residual stresses in this steel. Since residual stresses can be very important in stress corrosion cracking of pipeline steels, it was decided that conducting measurements on these steels would serve the objectives for both projects while meeting our current objective to evaluate the equipment needs for this project. (consider including digital pictures of test equipment)

In addition to these activities, NIST staff participated in the following meetings, committee activities, and preparations:

- i) Pipeline Research Council Corrosion Committee Meeting: May 12-14, Austin TX

A presentation was made by a NIST staff member (RER) on the new NIST program and a meeting was held at the end of the meeting to form an industry support group to provide industry inspection data and other industry support that may be needed by the NIST program (Keith Wooten, ConocoPhillips, Ponca City, OK, Chair).

- ii) Quarterly PSIA Coordination Meeting, May 19, Gaithersburg, MD
NIST hosted this quarterly meeting of government agencies involved in pipeline research that will coordinate activities throughout these agencies to improve the effectiveness and impact of pipeline programs. Participants included representatives from DOI/MMS (M. Else), DOT/OPS (J. Merritt, R. Smith), DoE/FE (C. Freitas, R. Anderson), TLW (T. Wilke) and DoC/NIST (R. Ricker, F. Gayle, C. Handwerker)
- iii) DoE/INEEL Underground Corrosion Program, May 2004, Gaithersburg, MD
Kay Addler-Flitton of INEEL made a presentation at NIST on the underground corrosion program at INEEL and their experience on retrieving samples that were buried by NIST researchers in the 1970s.
- iv) Government-Industry Pipeline R&D Forum, Organizing Committee Meetings
An initial meeting of the organization committee for this meeting was held in July with NIST staff participating.

2. Activities Planned for the Next Reporting Period

- a) Task 2 Literature Review –on going
NIST will continue to examine the published literature in an attempt to identify reliable data sources and information that will reduce experimental needs. Analysis of existing data sets will be attempted in an effort to provide potential corrosion damage rate modeling approaches.
- b) Task 3 Collation of Corrosion rate data –on going
DoE/INEEL Underground Corrosion Program NIST personal will continue to provide technical support in the retrieval and review of samples in this program.
- c) Task 4 Gap analysis and path forward
Laboratory Equipment set-up and evaluations NIST will continue to establish experimental capabilities in this area. In particular, some preliminary experiments will be conducted to evaluate the effectiveness of different experimental approaches, measurements methods, or hypotheses for the corrosion damage rate predictions.

Meetings and Committee Activities

NIST will continue to support the pipeline R&D community through participation in the organization of meetings, standards committee activities, and through participation in the interagency PSIA coordinating committee. In addition, NIST will meet with a representative from GM who specifically requested to meet with the NIST pipeline program due to their concerns about standards for future pipelines that

will be needed to provide hydrogen for the hydrogen fueled vehicles they are developing.

3. Problems, Issues or Concerns

None at this time.

4. Anticipated Task Completion Dates

On schedule per the statement of work in the August 4, 2004 modified agreement.

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