

## Quarterly Report

### Public Page

Date of Report: *June 30, 2015*

Contract Number: *DTPH56-14-H-00003*

Prepared for: *Government Agency: DOT*

Project Title: *Strain-based design and assessment in critical areas of pipeline systems with realistic anomalies*

Prepared by: *Center for Reliable Energy Systems (CRES), C-FER, NIST, and CANMET*

Contact Information: *Ming Liu (mliu@cres-americas.com, 614-376-0767) and Yong-Yi Wang (yywang@cres-americas.com, 614-376-0765)*

For quarterly period ending: *June 30, 2015*

### 1 Work Completed in this Quarter

All pipes for full-scale tests have been received by the testing lab. Pipes for curved wide plate (CWP) tests are at the workshop for welding fabrications. The welding fabrications for CWP are in progress and two of four welds have been completed.

Finite element analyses (FEA) for pipes with transition welds or different anomalies (i.e., corruptions and dents) were continued. The focus was on (1) testing support: supporting the refinement of specimen design and testing procedure and (2) model development: identifying the controlling parameters and mechanisms for different anomalies.

The sizes of corrosion anomalies for full-scale tension, bending, and burst tests were determined. The dent sizes for full-scale bending tests were also determined.

The studies on the key controlling parameters and mechanisms for various problems were continued and the key controlling parameters and mechanisms have been being identified.

Three full-scale burst tests including two tests with varying levels of longitudinal pre-strain (induced by wrinkle formation) and one reference test (with no pre-strain) were completed. The full-scale tension tests of pipes with corrosion defects were commenced.

Monthly reports were submitted online. The first in-person progress review meeting was held on 5/14/2015 in Edmonton, Canada. The project team attended a peer review meeting on 5/27/2015.



## 2 Work Planned for the next Quarter

The work planned for the next quarter includes: (1) small-scale tests, (2) curved-wide plate tests, (3) finite element analyses and model development, (4) remaining full-scale pipe tests, and (5) project management, monthly and quarterly reports, and meetings.

