FINAL PROJECT SUMMARY REPORT

PROJECT IDENTIFICATION INFORMATION

Business Firm:

Intelligent Optical Systems, Inc.
2520 W. 237th Street
Torrance, CA 90505-5217

DOT SBIR Program

DOT Contract No.

DTRT57-09-C-10044

Period of Performance:
From 09/04/2009 to 03/03/2010

Project Title: Low Cost, Full-Field Surface Profiling Tool for Mechanical Damage Evaluation

SUMMARY OF COMPLETED PROJECT

Mechanical damage (typically from third party excavations) is the most frequent source of leaks and ruptures in pipelines. The most common type of mechanical damage is dents, sometimes associated with secondary features such as gouges, external corrosion, or cracks. Currently used mechanical measurement techniques for assessing dents are not accurate enough for the reliable determination of fitness for service. In this Phase I project, Intelligent Optical Systems has established the feasibility of implementing a novel surface-profiling tool for mechanical damage evaluation based on the real-time processing of a single digital image. The cost and processing time are much lower than the equivalent values for laser scanning tools now being considered for this application. Aside from the above operational advantages, we have shown that our full-field approach provides the absolute depth profile of the damaged region with 100 μm accuracy, and that areas of corrosion, as well as damaged regions, can be profiled.

The successful development of the proposed system will yield a new class of pipeline monitoring equipment capable of the rapid, accurate surface profiling of damaged and corroded regions. Given the capital invested in pipeline infrastructure, we anticipate strong commercial interest in this initial target market, with a strong potential to apply this novel technology to a wider field of structural inspection and monitoring applications.

APPROVAL SIGNATURES

Marvin Klein
Principal Investigator/
Project Director

Date: 3/30/10