

ELEMENTS OF AN ENGINEERING-BASED INTEGRITY MANAGEMENT PROGRAM

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ABSTRACT

Establishing pipeline integrity requires an understanding of the specific threats, their relationship to the overall condition of the pipeline, and the mitigating measures required to assure safe operation. In the past, the pipeline industry relied on years of research and experience to develop a set of tools to analyze these threats and apply conservative solutions to ensure pipeline integrity. With the implementation of the Integrity Management Program (IMP) in 2004 by the Pipeline and Hazardous Material Safety Administration (PHMSA), pipeline integrity must be addressed by operators where the analysis methods and results must be documented and defensible.

This paper presents a detailed discussion of how existing knowledge, advances in analytical techniques, experimental methods, and engineering rigor are combined to develop field-friendly tools to characterize and ensure pipeline integrity. Two case studies are included, the first, to demonstrate how the proposed method was used to assess the integrity of a corroded elbow, the second, provides the reader with an example of how to develop a tool for evaluating the severity of dents in pipelines using available public-domain research. It is the hope of the authors that the approach presented in this paper will foster further developments and advanced pipeline integrity management.

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