

ASSESSING THE EFFECTS OF EXTERNAL DAMAGE ON SUBSEA PIPELINES

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ABSTRACT

Subsea pipelines and flowlines are periodically subject to anchor snags that result in massive pipeline movements and/or local deformation. Knowing how to assess these types of damages is often challenging, especially considering the potential for product release. Along the same lines, operators are hesitant to shut down operation or remove lines from service unless absolutely necessary. For this reason, Stress Engineering Services, Inc. is frequently called upon to work with operators to assess the extent of pipeline damage.

This paper provides case studies involving impact with actual pipelines and what steps were taken to determine the severity of damage. In presenting these case studies, an assessment methodology will be presented that includes specific steps for performing a damage assessment. This approach is built upon lessons learned from prior evaluation and draws heavily from resources involving finite element methods as well as a database integrating more than 15 years worth of full-scale pipeline testing. Additionally, discussions on assessing damage using the current ASME gas and liquid pipeline codes will be provided. The value of the work presented in this paper is that pipeline operators can better position themselves to appropriately respond to pipeline damage using a methodology that has permitted the continued safe operation of subsea pipeline systems.

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