

Title

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Abstract

Ground subsidence can threaten the integrity of buried pipelines in areas with prior and on-going mining activities. The integrity can be assessed by comparing the strain demand and the strain capacity. The Tensile Strain Capacity (TSC) of the pipeline is dominated by the girth welds due to their relatively inferior property in comparison to the base pipe materials. Parametric models developed at CRES for US DOT and PRCI allow the evaluation of girth welds TSC based on pipe dimensions, base material and weld properties and flaw size. The local buckling of the pipeline under compressive or bending loads determines the Compressive Strain Capacity (CSC). Three existing standards are used to evaluate CSC, including DNV OS-F101, CSA Z662 and API RP 1111. The strain demand analysis of the pipeline under multiple subsidence scenarios is presented in a companion paper. The strain demand is compared with TSC and CSC separately to evaluate the pipeline integrity. The use of CRES TSC models for selecting a variety of design and material parameters to improve TSC is illustrated.

Keywords

Strain Based Design, Strain Capacity, Pipeline Integrity