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Abstract

This paper covers tensile strain design, which has at least three key elements, including (1) linepipe specifications / qualification, (2) girth welding procedure qualification and field girth welding practice, and (3) tensile strain models. A brief summary of linepipe specifications, girth welding procedure qualification, and field girth welding is provided, with features specifically important to SBD highlighted. The focus of the paper is on tensile strain models and their applications. The fundamental principles and structure of the PRCI-CRES tensile strain models are presented. Processes and procedures for obtaining non-conventional input parameters such as apparent CTOD toughness are introduced for users to apply the models. Various ways of applying the models and the limits of the models are given. Finally, examples are shown for the strain-based design of new pipelines and strain-based assessment of existing pipelines.

Keywords

Pipeline, Strain-based design and assessment (SBDA), Tensile strain models, Applications of SBDA