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## **Abstract**

Tensile strain design is an essential element of the overall strain-based design methodology. This paper focuses on the apparent toughness approach and introduces the concept of apparent CTOD resistance curve (CTODR). The determination of apparent toughness, CTODA, from the apparent CTODR is demonstrated. The prediction of tensile strain capacity (TSC) using the CTODA and the traditional tangent method is conducted. Similar results are obtained from both approaches. The value of apparent CTODR is found to be relatively insensitive to the amount of flaw growth after some limited initial growth. This insensitivity allows the determination of CTODA at the small amount of flaw growth. This feature establishes the connection between CTODA and initiation based toughness. Further work is under way to apply these findings.

### **Keywords**

Pipeline, Girth weld, Strain-based design, Tensile strain capacity, Apparent toughness, Tearing resistance curve