# ENHANCED GIRTH WELD PROCEDURE QUALIFICATIONS

## *TO PRODUCE STRAIN-RESISTANT GIRTH WELDS*

**Why?**

Girth weld failures have occurred in newly constructed pipelines during service and in pre-service hydrostatic testing. Girth welds meeting the minimum requirements of standards may not be sufficient to resist loads imposed on them from pipeline construction and operations.

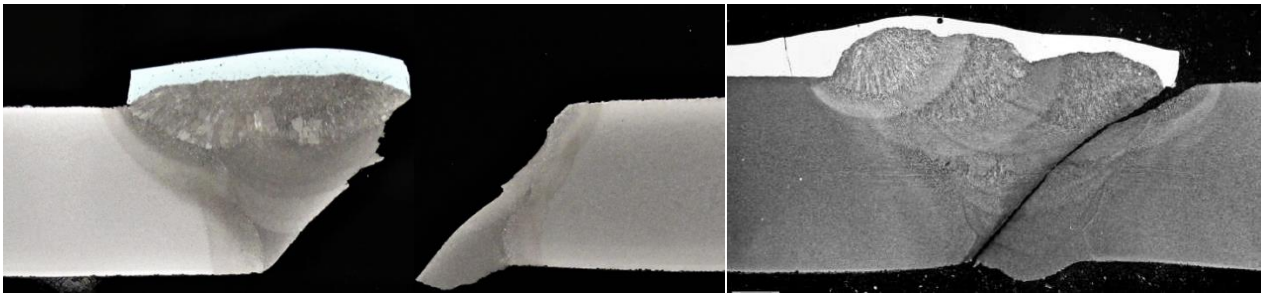

Figure 1 Cross-sections of two failed girth welds

**What Are the Benefits of Enhanced Qualifications?**

- Reduced risk of girth weld failures and related to societal and economic consequences
- Meeting regulatory requirements and expectations, such as CER SA 2020-01

**What Does Enhanced Qualification Include?**

- Selection of welding processes and consumables for strain-resistant girth welds
- Fabrication of qualification welds
- Qualification tests required by standards and company specifications
- Additional tests to support the characterization of tensile strain capacity (TSC)
- Analysis to ensure the attainment of target TSC
- Guidance on the use of qualified procedures:
  - Requirements of current standards, such as API 1104 and CSA Z662
  - Rationale and limits of qualification requirements in current standards
  - Additional guidance, such as the maximum pipe strength the procedures may be used.
  - Quality assurance in field production welds

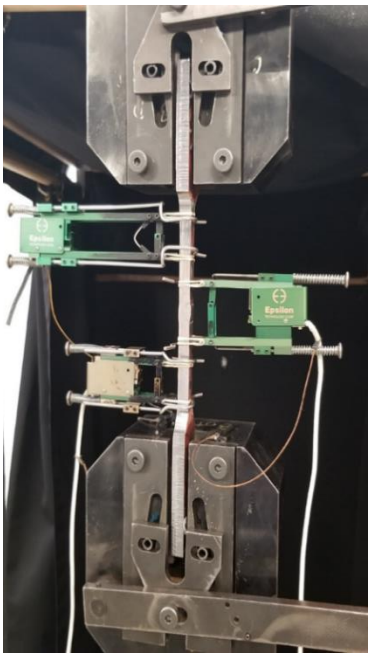

Figure 2 Instrumented cross-weld tensile test

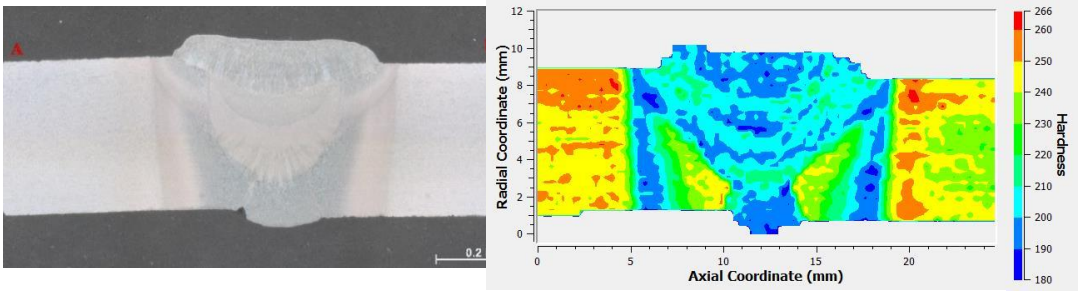


Figure 3 Etched weld macro (left) and microhardness map (right)