CAU2012

CAESAR II

Recent changes in ASME B31.3 and their implementation in CAESAR II

INTERGRAPH

Weld Joint Strength Reduction Factor

- The creep strength of welds may be lower than the creep strength of the base material
- Mandatory consideration in membrane stress
- Optional in bending stress

(e) *Weld Joint Strength Reduction Factor, W.* At elevated temperatures, the long-term strength of weld joints may be lower than the long-term strength of the base material. For longitudinal or spiral welded piping components, the product of the allowable stress and the applicable weld quality factor, *SE*, shall be multiplied by the weld joint strength reduction factor, *W*, when determining the required wall thickness for internal pressure in accordance with para. 304. The designer is responsible for the application of weld joint strength reduction factors to welds other than longitudinal and spiral (e.g., circumferential). The weld joint strength reduction factor, *W*, is equal to 1.0 when evaluating occasional loads such as wind and earthquake, or when evaluating permissible variations in accordance with para. 302.2.4. The pressure rating or allowable stress for the occasional load or variation condition is not required to be reduced by the weld joint strength reduction factor. It is also not required when calculating the allowable stress range for displacement stresses, S_A, in para. 302.3.5(d). The weld joint strength reduction factor only applies at weld locations. The weld joint strength reduction factor is the ratio of the nominal stress to cause failure of the weld joint to that of the base material for the same duration. Except as provided in (f) below, the weld joint strength reduction factor, *W*, shall be in accordance with Table 302.3.5.

INTERGRAPH