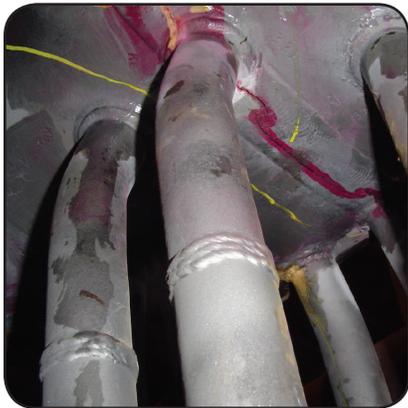


INDUSTRY NOTICE



HEADER GIRTH WELD CRACKING

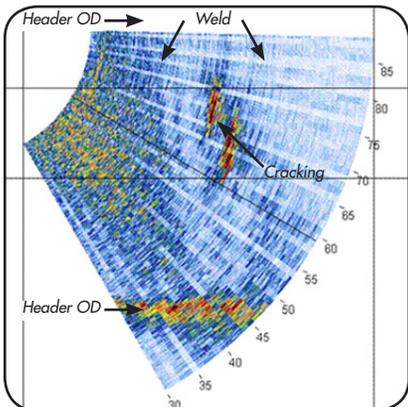
Recent inspections have shown a significant increase in the number of cracked girth welds in superheater and reheater outlet headers. Specifically, in 2004 macrocracking has been found in more than 25% of the high temperature headers inspected. These cracks have been observed in:



Through Wall, Weld Centerline Crack in a High Temperature Header Girth Weld

- Both header body and header-to-tee welds which had been produced in the shop using SAW,
- Welds penetrated by stub tube bore holes and in non-penetrated welds,
- Headers produced by different manufacturers,
- Headers with and without ligament or stub tube weld cracking.

Through-wall cracks, extending from 90 to 180 degrees around the circumference, have been detected in some welds, with subsurface cracking of smaller extent found in welds in other headers. Where laboratory evaluation has been performed, creep has been confirmed as the primary damage mechanism. Thus, based on current understanding, it appears that long-term creep is leading to subsurface crack initiation, with subsequent crack growth necessary before the defects are apparent on the surface. With typical inspection methods there is thus a high risk that cracks will only be detected when failure occurs and immediate major repairs are required



Linear Array Ultrasonic Image of Subsurface, Creep Cracking along the Centerline of a Header Girth Weld

From inspections performed by Structural Integrity, the use of linear phased array UT imaging has been effective in:

- Determining girth weld profiles,
- Detecting and sizing of subsurface cracking,
- Locating macro-damage relative to the weld geometry.

The range of observations indicates that this is an industry wide concern. The utilities where cracking has been found are working with Structural Integrity and EPRI to develop a program, which will:

- Identify and quantify the factors that influence the development and progression of damage,
- Assess the reliability of applied inspection techniques,
- Evaluate the effectiveness of predictive lifing models.

If you have any questions or additional experience regarding this important issue contact:

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