

**Proposed Abstract for International Pressure Equipment  
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**Case Study: Fitness-For-Service Evaluation of Fired Heater Manifold**

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An inlet manifold of a fired heater manifold became out-of-round after annealing. The degree of deformation exceeded the 1.5% limit specified in ASTM A999<sup>1</sup> for thin-walled pipes.

The manifold was a part of the continuous chemical process. It was made of 347 stainless steel and contained 67 extruded outlets with welded branches, so replacement of the header would be costly. The header operated at 530°C and 425 kPa.

An API 579 FFS Fitness-For-Service Level 3 assessment of the damaged header was performed at different operating conditions. Several modes of failure were considered.

Based on the results of the assessment, the safe operating limits of the header were established, and the header was successfully put back in service.

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<sup>1</sup> ASTM A999/A999M-01 Standard Specification for General Requirements for Alloy and Stainless Steel Pipe