“Challenges Obtaining and Implementing Welding Alloys for High Temperature Stainless and Super Nickel Steel Weldments”

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The opinions expressed in this presentation are the opinions of the author, not the official opinion of the responsible API, ASME, AWS or ISO Committees.
Special Welding Alloy Inventories

- Inventories small vs. low carbon & 3XX stainless steels
- Low commercial demand
- Expensive to manufacture
- Many discontinued due to mergers, sagging sales, loss of inventory funding
- Long lead times: up to 24 weeks

308H  347H  16-8-2  25-35  35-45  21-33  617  230W  740
Welding Technique Issues

• Alloy vs. Technique Issue
• High Carbon SS vs. Nickel & Nickel Super Alloys: similar issues
• Dilution
• Groove Geometry
• Weld Bead/Layer Geometry
• All must be considered and controlled to avoid cracking and microfissuring
• Assure melting weld metal, NOT remelting (EPRI’s Power Ratio)
• Dissimilar Weldments Introduce Additional Challenges
Weld Metal Evaluation & Testing

• Traditional Test Coupons & Specimens May be Inadequate

• Creative Test Assemblies
  – Induce Fabrication/Installation/Repair Stresses
  – Create Residual Stresses
  – Evaluate Cracking and Microfissures
EPRI P87 Test Specimen
QUESTIONS?

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Thank You!