

RIC 2004: Emergent Technical Issues, Session T-11

Bottom Mounted Instrumentation Experience

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STP Nuclear Operating Company

March 11, 2004

Bottom Mounted Instrumentation (BMI) Leakage Unit 1

- ◆ **On April 12th leakage identified via boric acid walk down inspections**
- ◆ **Total boric acid crystal for both penetrations = 153mg**

BMI Paradigms

- ◆ **Nuclear safety first**
- ◆ **Think 40 years not 40 days**
- ◆ **Pace the team**
- ◆ **Industry key stakeholder involvement**
- ◆ **Demonstrate conservative operational decision making**
- ◆ **Establish Detailed Communication Plan**

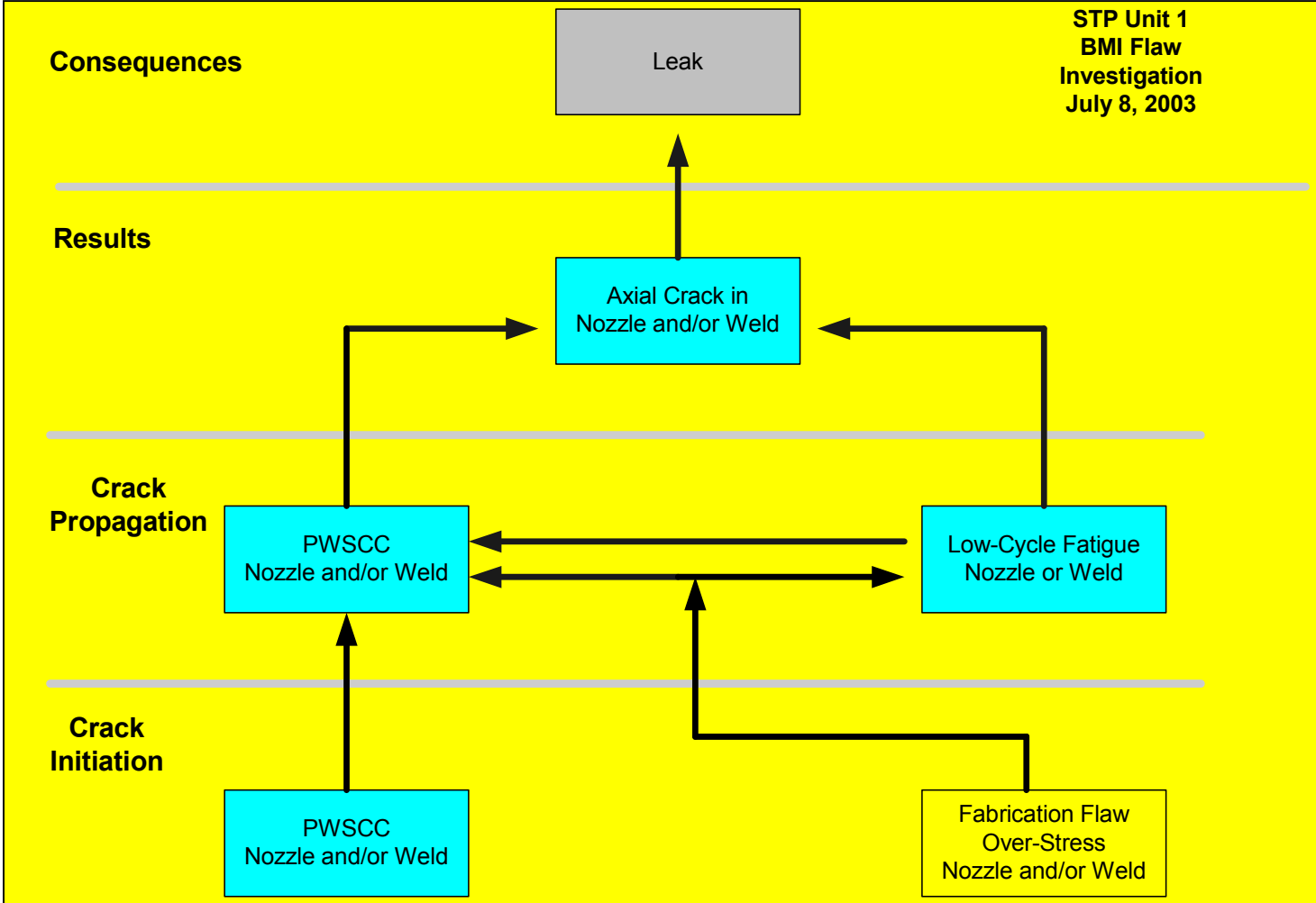
STP BMI Penetration #1 As Found



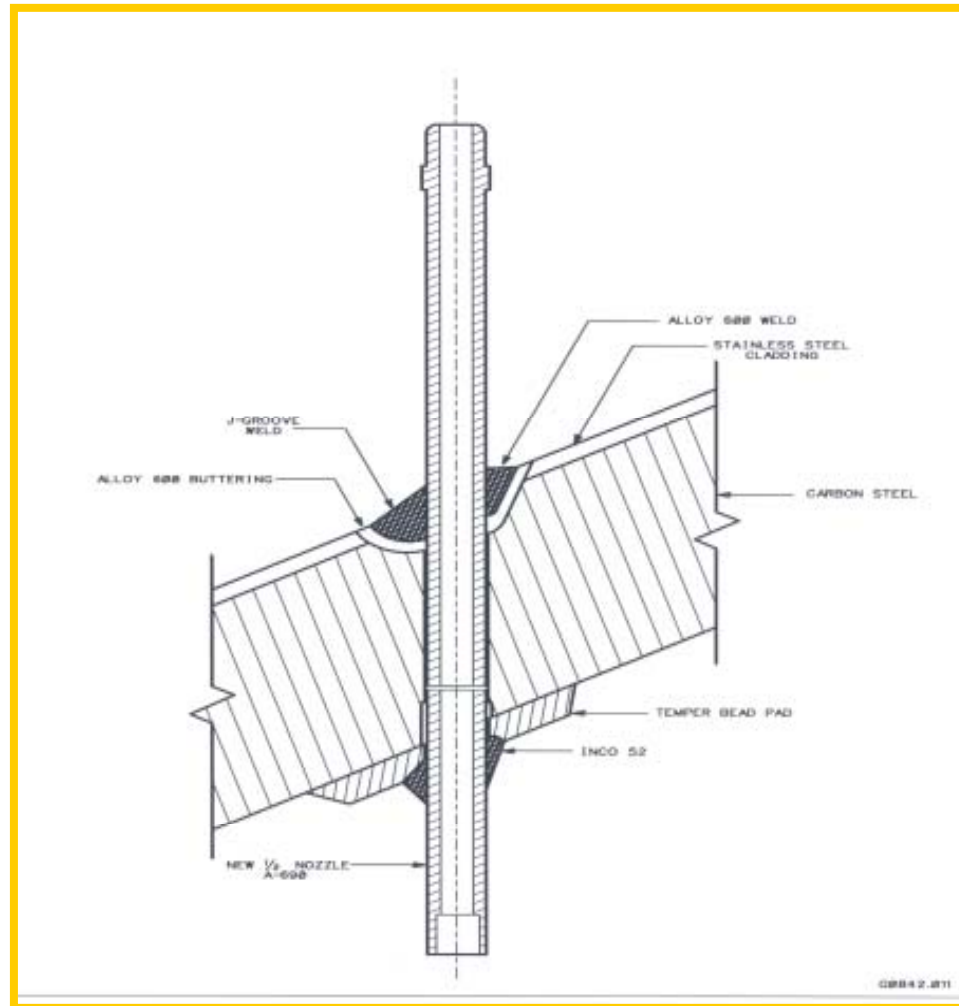
Examination Scope

- ◆ **Ultrasonic examination (UT) from penetration tube ID**
- ◆ **Enhanced visual exam of J-groove weld surface**
- ◆ **Volumetrically interrogate vessel base metal for wastage**
- ◆ **Eddy current examination (ET) from penetration tube ID**
- ◆ **ET of J-groove weld surface**
- ◆ **Profilometry [tube inside roundness / ovality]**
- ◆ **Borescope [tube inside visual] examinations**
- ◆ **Helium tests**
- ◆ **Metallurgical analyses of removed nozzle remnants**
- ◆ **Boat sample analyses**

Investigation Results



Permanent Half-Nozzle Repair



Completed Repair



Future Inspections

BMI Commitments

- **Both Units: Boric Acid Walkdown Inspection (VT)**
- **Unit 1:**
 - Volumetric (UT)/Enhanced (VT) all penetrations
 - Phased Array - (UT) of 1 or 46 (Inspection for Corrosion)
- **Unit 2:**
 - Boric Acid Walkdown Inspection (VT)
 - Volumetric (UT)

Future Inspections

Reactor Head Penetrations Both Units

- Bare Metal Visual
- Volumetric Examinations

Material Reliability Program (MRP) Recommended

Bare Metal Visual Inspection of Safe Ends

- RV Hot/Cold Legs
- Przr Surge
- Pzr Safety, Relief(3), Spray Nozzles

Alloy 600 Life Cycle Management

- **Identify Locations**
- **Perform Risk Assessment/Life Cycle Management Study for Strategic Direction**
- **Contingency Plans**
- **Perform Inspections**

BMI Summary

- ◆ **Demonstrated long term operational decision making**
- ◆ **Created new technology**
- ◆ **Employed industry best expertise**
- ◆ **Strong teamwork and safety culture provided the foundation for our success**