



# BWRVIP Operating Experience

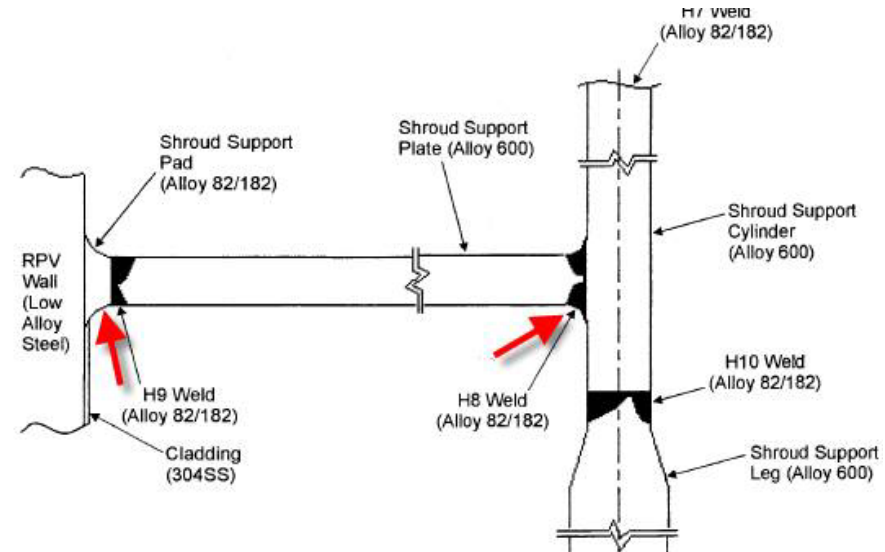
Chuck Wirtz, First Energy  
BWRVIP Integration Chairman  
EPRI-NRC Technical Exchange Meeting  
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# Key Operating Experience

- Monticello Shroud Support
- Susquehanna Jet Pump
- Perry Jet Pump
- Columbia Jet Pump
- Quad Cities Jet Pump

# Monticello Shroud Support

- During Spring 2011 refueling outage, Monticello inspected the bottom side (in lower plenum) of the H-8/H-9 shroud support welds while inspecting the core shroud legs
  - Inserted camera through jet pump throat



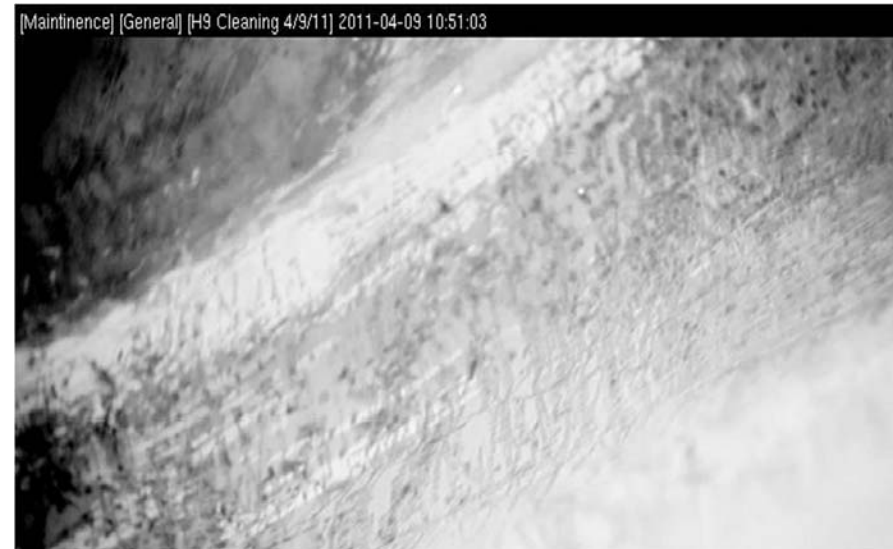
- A significant number of indications were observed extending circumferentially on both welds
  - Note that visual inspections on top side of welds were performed with no reportable indications
- Monticello concluded that indications were in the “scale layer” and not in the weld metal
- Executed a difficult cleaning process with hydrolaze and scraping

# Pre and Post Cleaning Results

As Found



Post Cleaning



- Monticello stated that post cleaning result confirmed theory of cracking in scale - opinions of BWRVIP members are mixed
- Additional exams performed in other jet pump locations and similar indications were observed
- Performed limited UT exam from RPV OD with no reportable indications in RPV shell
- Analyses performed to demonstrate large flaw tolerance in welds

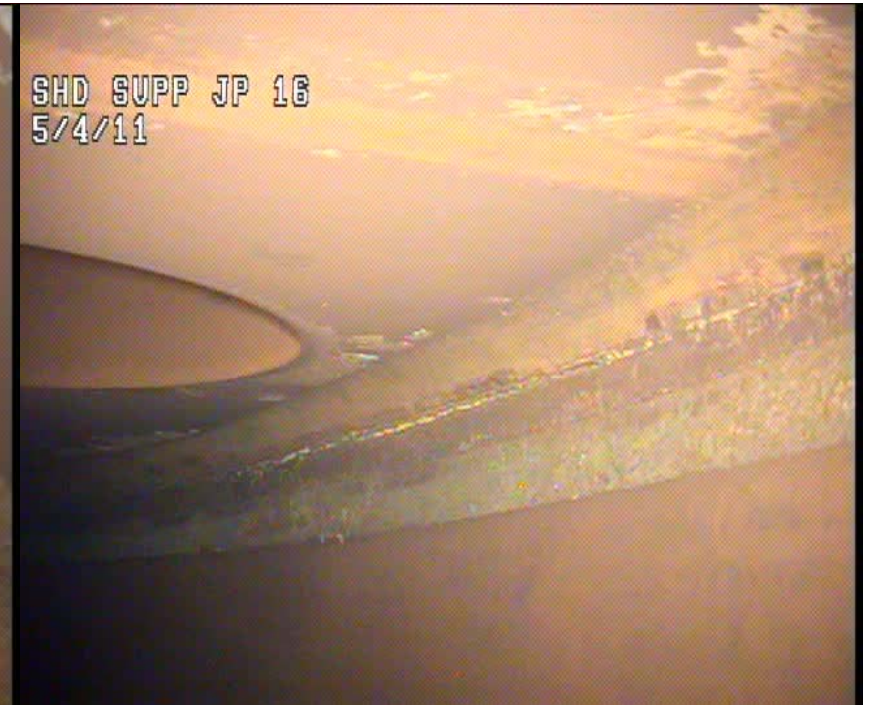


# Color Lower Plenum Shots from Perry

Close-up View Underside H9



Overview Underside H9



- Note the linear indication-like features along the line of scale that is at the lower toe of the H9 weld (where the Inconel weld metal meets the Inconel base metal build-up).

# Recent Jet Pump Operating Experience

- Susquehanna Unit 2 (BWR/4 251")
  - Large set screw gaps (> 100 mils)
  - Diffuser ID wear
  - Aux wedge damage
- Perry (BWR/6 238")
  - Significant wedge wear identified for the first time in a BWR/6
  - Significant restrainer bracket wear
  - Set screw gaps
- Columbia (BWR/5 251")
  - Indication found in RS-9 (Riser Pipe to Riser Brace weld)
- Quad Cities Unit 1 (BWR/3 251")
  - Indications found in RS-2 (Riser Pipe to Elbow weld)
  - Found in HAZ (elbow side of weld)
  - Likely IGSCC

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