



Relief Request 68 Progressive Liquid Penetrant (PT) Alternative
Pre-Submittal Meeting

Palo Verde Nuclear Generating Station (PVNGS)
October 6, 2021

Agenda

- Introduction
- Relief Request Summary
- Current Requirements
- Alternative Requirements
- Alternative Justifications
- Duration of Proposed Alternatives
- Precedents
- Schedule



Relief Request Summary

- Reason for the request:
 - Personnel safety
 - Eliminates Radiography Exposure Risk
 - Outage support
 - Eliminates impact outage activities
 - Eliminates additional boundary and Radiation Protection (RP) support
 - Eliminates additional engineering changes
 - ALARA
 - Radiography crew, RP, and boundary support personnel reduction



Current Requirements

- ISI Program is currently in the 4th Interval
- Current Section XI ASME BPV Code is the 2013 Edition
- Construction Code is ASME III 1974 edition Winter 1975 addenda
- For Repairs and Replacements Section XI refers to the Construction Code
 - ASME Section III, NB and NC-5222, requires radiography (RT) of Class 1 and 2 circumferential weld joints in piping



Alternative Requirements

- Progressive PT examinations:
 - Examinations performed on the root pass, approximately mid-wall, and on the final weld profile
 - Examination acceptance criteria of “no indications” would be required (commonly referred to as PT White)
- Limited to ASME Class 1 and 2 circumferential piping welds
 - 2” nominal pipe size and less in diameter
 - Schedule 160 and less in thickness



Alternative Justifications

- No indications allowed
- Multiple examinations per weld
 - Root pass, mid-wall, and final configuration
- ASME Section III partial penetration welds utilize this progressive examination technique
- Alternative provides additional margin when compared to 1:1 socket welds



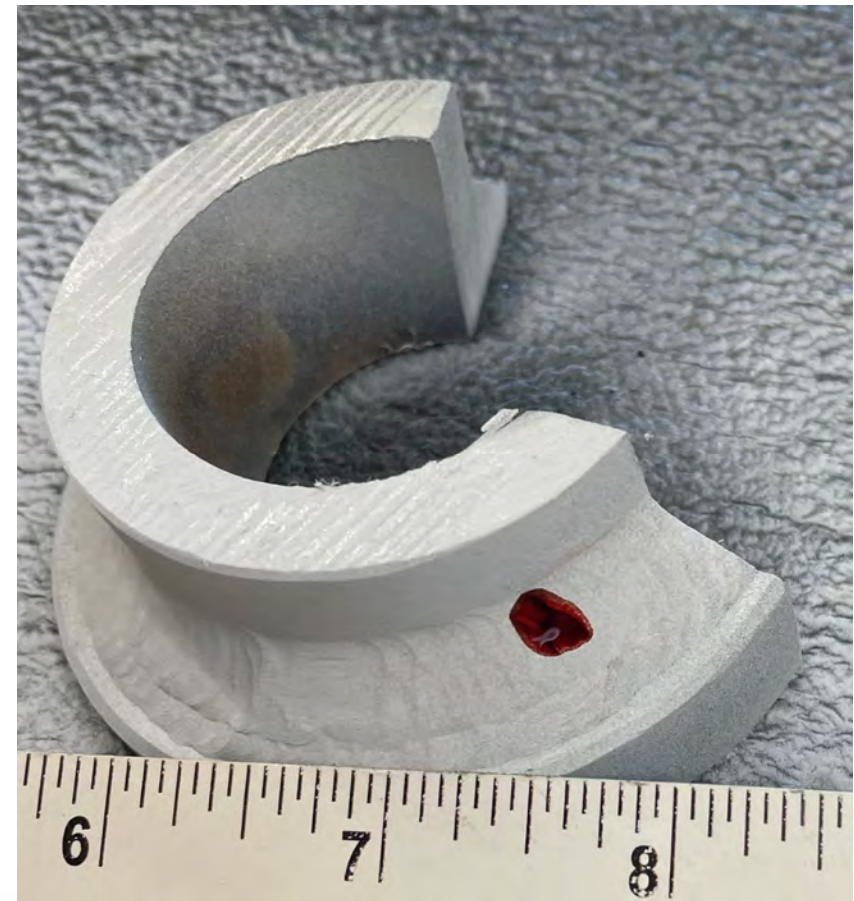
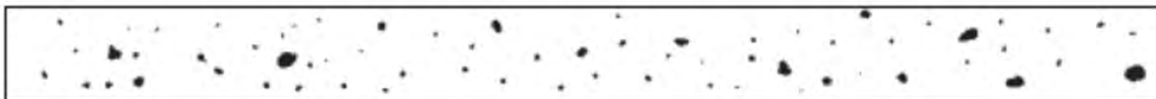
Alternative Justifications

ASME Class 1 and 2 Examination Requirements

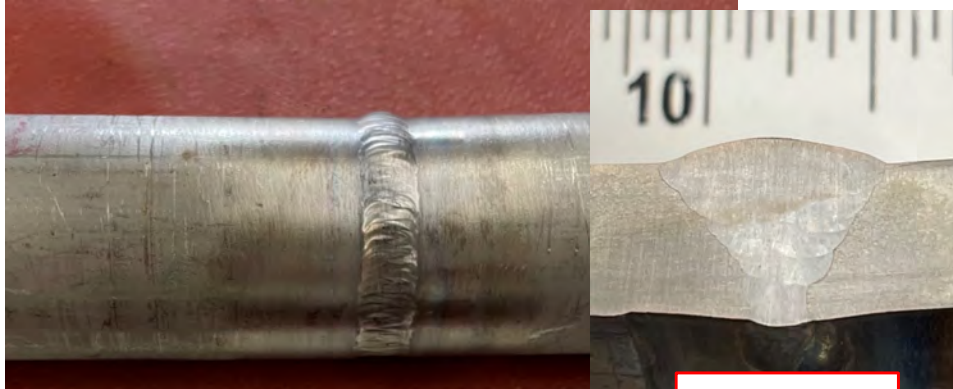
Butt Welds	Alternative Proposal	Socket Welds
Fitup Visual	Fitup Visual	Fitup Visual
	Root PT	
	Midwall PT	
Final Visual	Final Visual	Final Visual
Final RT (& *PT for Class 1)	Final PT	Final PT
Acceptance Criteria		
RT IP, IF or cracks > ¼" elongated ***multiple rounded	PT No detectable indications	PT * unlimited 1/16" and less 3/16" rounded >1/16" to 3/16"***

Notes: * Same acceptance criteria for Class 1 butt welds and Class 1 and 2 socket welds
 ** Acceptance provided for < 4 in a line and < 10 in an area
 *** Typical random rounded is 0.047" to 0.078" and isolated 0.063" to 0.104"

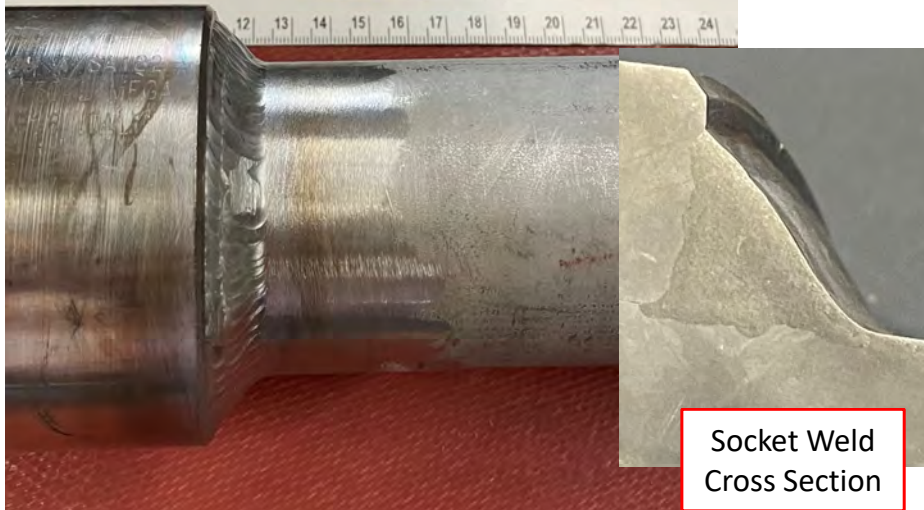
Figure VI-1136-2
 Charts for t Over ¼ in. to ¾ in. (6 mm to 10 mm), Inclusive



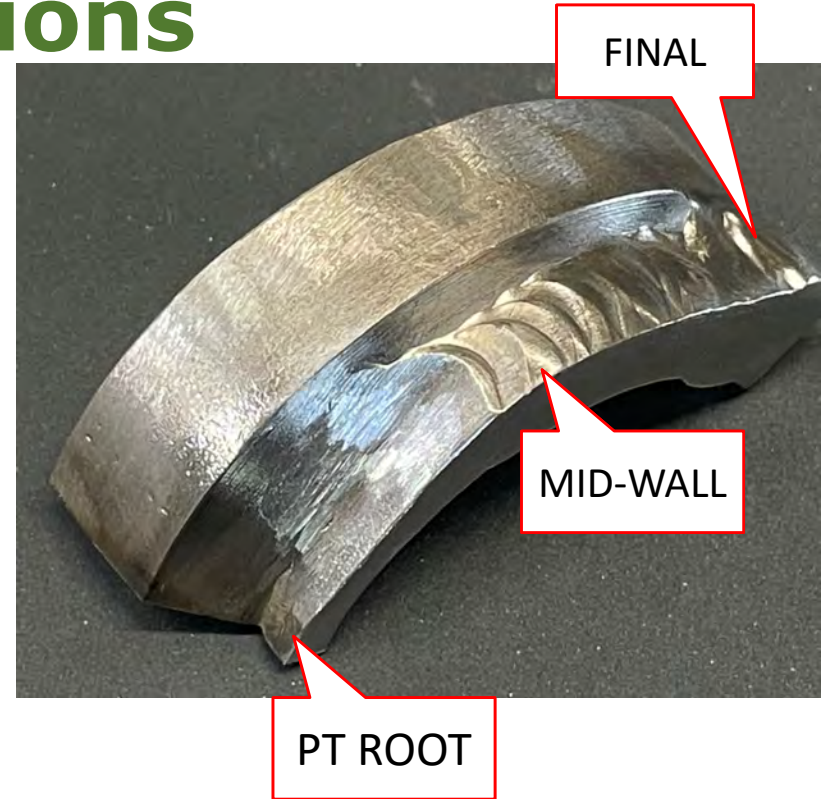
Alternative Justifications



Butt Weld
Cross Section



Socket Weld
Cross Section



FINAL

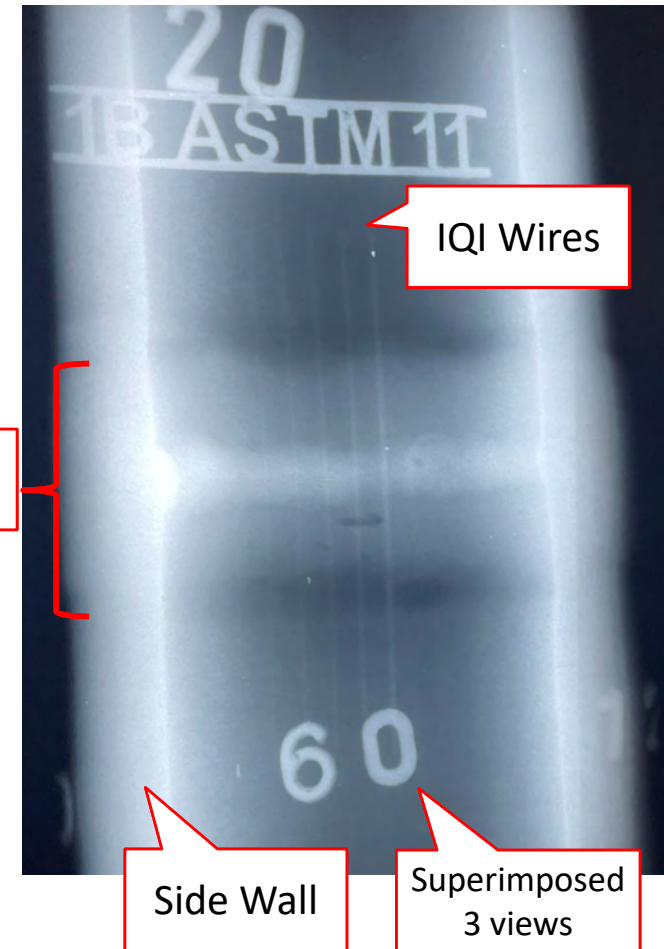
MID-WALL

PT ROOT



Alternative Justifications

- Alternative will utilize PT White (no indications) compared to:
 - ASME Section III required radiography:
 - Limited detectability for small diameter welds
 - Bevel angles for incomplete fusion
 - Acceptance criteria allows elongated and rounded indications
 - ASME Section III for Class 1 liquid penetrant:
 - Liquid penetrant has great detectability for surface indications
 - Acceptance criteria allows unlimited indications $< 1/16''$
 - Rounded indications up to $3/16''$ allowed



Duration of Proposed Alternatives

- The proposed alternative is requested for the remainder of the fourth 10-year ISI interval for each of the PVNGS units.
- The end dates are:
 - Unit 1: July 17, 2028
 - Unit 2: October 31, 2028
 - Unit 3: January 10, 2028



Precedents

- Millstone, Unit 2, ADAMS Accession ML093570237
- St. Lucie, Unit 1, ADAMS Accession ML17033A151



Schedule

- APS is planning to submit in October 2021
- NRC approval requested by September 2022

