

NRR-PMDAPEm Resource

From: MP Whalen (Generation - 3) [mp.whalen@dom.com]
Sent: Wednesday, August 07, 2013 3:59 PM
To: Sreenivas, V
Subject: Relief Request RAI from NRC Conference Call August 2 2013
Attachments: 2013-08-07 RAI Response Update .docx

V,

Friday, 8/2/13, NRC conference call regarding weld SW41. In our 2010 submittal on page 44 we discuss Weld SW41 and only getting 35% coverage. In the last sentence we take credit for one other weld on the segment with complete coverage that provides an acceptable alternative. The NRC is looking for two items:

1. Information on the other welds inspected this interval with >90 coverage with regards to it being in the same risk informed category, same failure mechanism, and same filler metal.
2. Looking for history of failures that have a similar failure mechanism (i.e., thermal fatigue). Can be our history and/or industry information.

The attached response provides the information to address each item. If you have any questions please advise. Thanks you

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From: MP Whalen (Generation - 3)

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"Sreenivas, V" <V.Sreenivas@nrc.gov>
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Response:

Category R-A, Item R1.11 components (elements subject to thermal fatigue), examined in the 4th Inspection Interval:

N1.R1.11.002, 11715-WMKS-0103AD / 6-RC-21 / SW-21, Elbow to Pipe, 94% coverage

N1.R1.11.005, 11715-WMKS-0103AJ / 6-RC-16 / 15, Valve to Elbow, 50% coverage (included in request)

N1.R1.11.008, 11715-WMKS-0103N / 6-RC-17 / 20, Valve to Elbow, 50% coverage (included in request)

N1.R1.11.010, 11715-WMKS-0103N / 6-RC-17 / SW-22, Pipe to Elbow, 100% coverage (geometry indications)

N1.R1.11.011, 11715-WMKS-0103N / 6-RC-17 / SW-23, Elbow to Pipe, 100% coverage (geometry indication)

N1.R1.11.300, 11715-WMKS-0103CD/2-CH-5/20A, Pipe to Pipe, 100% coverage

N1.R1.11.301, 11715-WMKS-0103CD / 2-CH-5 / 2A, Pipe to Reducer, 100% coverage

N1.R1.11.302, 11715-WMKS-0103CD / 3-CH-A-01 / 19, Pipe to Elbow, 97% coverage

N1.R1.11.304, 11715-WMKS-0103AD / 6-RC-21 / 15, Valve to Elbow, 50% coverage (included in request)

N1.R1.11.305, 11715-WMKS-0103AD / 6-RC-21 / SW-22, Pipe to Elbow, 94% coverage

N1.R1.11.306, 11715-WMKS-0103BB-1 / 3-RC-215 / SW-54, Elbow to Pipe, 100% coverage

The examinations identified no reportable indications (other than the geometry indications at the root and counterbore of the two elbows identified above).

N1.R1.11.037, 11715-WMKS-0109G-2 / 27 ½-RC-9 / SW-43, Weldolet-Pipe End, is scheduled to be examined in the 3rd period (3rd interval coverage only 22%).

Weld locations where full coverage cannot necessarily be obtained are selected for examination to increase the level of quality and safety of the NAPS inspection program by ensuring that the ISI examination scope includes a representative sample of configurations, locations, line sizes, materials,

etc. Full coverage can usually be guaranteed by selecting only pipe to pipe configurations, and among the risk-informed components subject to thermal fatigue (R-A / R1.11) there are enough to ensure full coverage for every examination. It would reduce the level of quality and safety of the examination program to completely avoid examination of the weldolet connections to branch piping or connections to other components like valves and pumps, where the Code only allows claiming up to 50% coverage.

EPRI developed MRP-146, "Materials Reliability Program Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines," in order to provide screening, evaluation, monitoring, inspection, operations, maintenance, and modification guidance to enable utilities to avoid thermal fatigue cracking due to valve in-leakage or turbulence/swirl penetration effects in affected lines. Although weld SW-41 is classified in the Risk-Informed ISI Program as R-A / R1.11, subject to thermal fatigue, this branch connection weldolet at the top of the RCS pipe is not considered for evaluation under the MRP-146 guidelines.

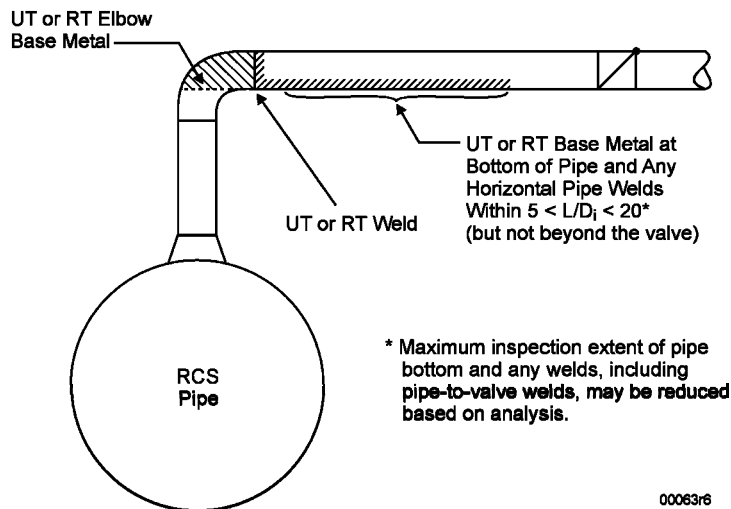


Figure 2-12
Examination Zones for Butt-Welded Lines Vertically Upward from RCS Piping

2. Looking for history of failures that have a similar failure mechanism (i.e., thermal fatigue). Can be our history and/or industry information.

Response:

North Anna Power Station has not experienced any failures associated with the branch connection lines subject to thermal fatigue. MRP-146, Table B-1, identifies PWR Reactor Coolant Leakage in Non-Isolable Lines Attributed to Thermal Fatigue, and none of the identified failures seems to be at a branch connection weldolet like weld SW-41. Please refer to MRP-146, Table B-1, for a list of relevant events in the industry where thermal fatigue leakage has been observed in reactor coolant systems in PWR plants worldwide.

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