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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No. 15-495
NSSL/MLC R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
TRANSMITTAL OF COMMITMENT INFORMATION RELATED TO APPROVED
ALTERNATIVE REQUEST RR-04-20, USE OF WELD OVERLAYS AS AN
ALTERNATIVE REPAIR AND MITIGATION TECHNIQUE

By letter dated April 11, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14112A071), as supplemented by letter dated October 14, 2014 (ADAMS Accession No. ML14294A453), Dominion Nuclear Connecticut, Inc. (DNC), submitted Alternative Request RR-04-20 for Millstone Power Station Unit 2 (MPS2), to allow the application of full structural weld overlay (FSWOL) over two dissimilar metal welds (DMWs). The proposed approach is an alternative to the requirements of American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, IWA-4000. By letter dated April 24, 2015 (ADAMS Accession No. ML15082A409), pursuant to 10 CFR 50.55a(z)(1), the Nuclear Regulatory Commission (NRC) authorized the use of Alternative Request RR-04-20 for the installation of FSWOL on the DMWs and adjacent similar metal welds during the fall 2015 refueling outage at MPS2 (i.e., 2R23). By letter dated October 18, 2015, DNC submitted a revision to Alternative Request RR-04-20 to request an alternative to the base metal liquid penetrant examination previously approved by the NRC in letter dated April 24, 2015. The revision to Alternative Request RR-04-20 was verbally approved by the NRC on October 19, 2015.

By DNC letter dated April 11, 2014, DNC committed to provide the NRC information related to Alternative Request RR-04-20. This letter transmits the information committed to by DNC in the April 11, 2014 letter. The final UT examinations of the FSWOLs installed during 2R23 were completed on October 14, 2015.

If you have any questions in regard to this letter, please contact Wanda Craft at (804) 273-4687.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering

A047
NRR

Commitments made in this letter: None

Attachment:

- 1) Transmittal of Commitment Information Related to Approved Alternative Request RR-04-20, Use of Weld Overlays as an Alternative Repair and Mitigation Technique

cc:

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ATTACHMENT 1

**TRANSMITTAL OF COMMITMENT INFORMATION RELATED TO ALTERNATIVE
REQUEST RR-04-20, USE OF WELD OVERLAYS AS AN ALTERNATIVE REPAIR
AND MITIGATION TECHNIQUE**

**MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.**

**TRANSMITTAL OF COMMITMENT INFORMATION RELATED TO ALTERNATIVE
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By DNC letter dated April 11, 2014, DNC committed to provide the NRC information related to Alternative Request RR-04-20. This letter transmits the information committed to by DNC in the April 11, 2014 letter. The final UT examinations of the FSWOLs installed during 2R23 were completed on October 14, 2015.

The two DMWs and adjacent stainless steel welds to which Alternative Request RR-04-20 applies are as follows:

Nozzle Type	Material Identification				
	Nozzle (carbon steel)	DMW weld (Nickel Alloy)	Safe end (stainless steel)	ISI Weld (stainless steel)	Pipe/fitting (stainless steel)
Hot Leg Drain Line, 2 inch NPS	A-105, Gr.2 (P1)	BPD-C-1001	SA-182, TP-316 (P8)	BPD-C-1003	A-376, 316 (P8)
RCS Cold Leg Letdown Line, 2 inch NPS	A-105, Gr.2 (P1)	BPD-C-4000	SA-182, TP-316 (P8)	BPD-C-4002	A-376, 316 (P8)

The commitments made to the NRC and the supporting information are provided below.

Commitment 1

Prior to entry into Mode 4 following completion of the weld overlays a preliminary report shall be submitted with results of evaluations that are described in Paragraphs g(2) and g(3) of Code Case N-504-4, which requires the following information:

- evaluations of residual stresses and flaw growth of the repaired welds,
- effects of any changes in applied loads as a result of weld shrinkage from the entire overlay on other items in the piping system,
- analysis to confirm that the requirements of sub articles NB-3200 and NB-3600 of the ASME Code, Section III are satisfied. The analysis includes the crack growth calculations to demonstrate that crack growth in the weld overlay or base metal is acceptable and residual stress distribution in the weld overlay and original weld demonstrate favorable stress distribution.

Information for Commitment 1

Westinghouse report WCAP-16896, Rev. 2 (Reference 1) provides the technical basis for application of the FSWOLs at MPS2. The report describes the geometries of the FSWOLs, summarizes the associated analyses, and provides the methodology used to demonstrate the acceptability of the FSWOL design qualifications. Proprietary and nonproprietary versions of WCAP-16896, Rev. 2 were submitted to the NRC by letter dated July 23, 2009 (Reference 2) in support of NRC's review and approval of RR-89-61, Rev. 2.

The FSWOLs installed during 2R23 are in accordance with the letdown/drain nozzle overlay design analyzed in WCAP-16896, Rev. 2, Section 11. Therefore, the analysis remains valid and will not be resubmitted by DNC in this letter. The previously submitted analysis fulfills the preliminary analysis submittal requirement of Commitment 1.

Specifically, for the FSWOLs installed during 2R23, WCAP-16896, Rev. 2, Section 11.6 demonstrates compliance with the requirements of Section III, NB-3200 and NB-3600, while Sections 11.2 through 11.5 demonstrate compliance with the requirements of Section XI, IWB-3600. Section 11.5 demonstrates that assumed crack growth will not adversely affect the integrity of the overlaid welds.

Additionally, in accordance with Commitment 1, DNC measured the shrinkage of the piping induced by the overlay application and determined that it is less than the value, 0.50 inches, already analyzed in addenda to the pipe stress calculations for the branch piping. The addenda determined that the effect of applied loads due to shrinkage was acceptable for other items in the piping system, including pipe supports. These individual piping shrinkage calculation addenda are available in plant records. Post-modification inspection of affected supports was performed with acceptable results.

Commitment 2

Within 14 days of completion of the final ultrasonic test (UT) examination of the FSWOL installations, the following information will be submitted to the NRC:

- a listing of indications detected,
- the disposition of the indications using the standards of ASME Code Section XI, IWB-3514-2 and/or IWB-3514-3 criteria and, if possible, the type and nature of the indications,
- a discussion of any repairs to the weld overlay material and/or base metal and the reason for the repairs.

Information for Commitment 2

The final FSWOLs were examined using a qualified non-encoded phased array ultrasonic examination procedure. The FSWOL weld material was examined to identify lack of bond and/or lack of fusion at the overlay to the underlying base material interface. In addition, the FSWOL weld material was examined to detect welding defects such as inter-bead lack of fusion or cracks. The original weld and adjacent base material were also examined to detect existing cracks that may have propagated into the upper 25% of the underlying material, or have extended into the overlay material during welding.

No limitations were encountered and 100% coverage of the required examination volume was obtained. No recordable indications were detected during the ultrasonic examinations of the completed weld overlays. Therefore, no indications required disposition in accordance with the standards of ASME Code Section XI, IWB-3514-2 and/or IWB-3514-3 criteria.

No repairs were required to the weld overlay material and/or base metal as a result of the ultrasonic examinations.

During the final liquid penetrant examination of the final FSWOL surfaces, several relevant indications were identified. After minor surface conditioning, these indications were either reduced to an acceptable size or removed.

Commitment 3

Within 60 days of plant restart, a final report shall be submitted with results of evaluations that are described in Paragraphs g(2) and g(3) of Code Case N-504-4, which requires the following information:

- evaluations of residual stresses and flaw growth of the repaired welds,
- effects of any changes in applied loads as a result of weld shrinkage from the entire overlay on other items in the piping system,

- analysis to confirm that the requirements of sub articles NB-3200 and NB-3600 of the ASME Code, Section III are satisfied. The analysis includes the crack growth calculations to demonstrate that crack growth in the weld overlay or base metal is acceptable and residual stress distribution in the weld overlay and original weld demonstrate favorable stress distribution.

Information for Commitment 3

The information required to satisfy Commitment 3 is the same as that required for Commitment 1, except that it must be final information. The field work associated with the FSWOLs is complete. Because no recordable indications in the outer 25% of the original base metal of the nozzles and safe ends were identified, no updates to the evaluations and design analyses are required. Therefore, the information provided for Commitment 1 bounds the final installed configuration of the FSWOLs and is considered final. Since no additional information is required, DNC concludes this commitment has been met.

References

- 1) Westinghouse report WCAP-16896, "Millstone Unit 2 RCS Surge, Spray Shutdown Cooling, Safety Injection, Charging Inlet, and Letdown/Drain Nozzles Structural Weld Overlay Qualification," Rev. 2, dated June 2009.
- 2) DNC Letter 09-376, Millstone Power Station Unit 2, "Request RR-89-61, Revision 2, Alternative Repair and Mitigation Requirements for Structural Weld Overlays," dated July 23, 2009 (ADAMS Accession No. ML092090215).