VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

December 6, 2002

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Serial No. 02-701A
NLOS/ETS R0
Docket No. 50-339
License No. NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT 2
REQUEST FOR ADDITIONAL INFORMATION
ASME SECTION XI INSERVICE INSPECTION PROGRAM
RELIEF REQUEST IWE9 CONTAINMENT TESTING

In a November 14, 2002 letter (Serial No. 02-701), Virginia Electric and Power Company (Dominion) requested an alternative to the test requirement of ASME Section XI, paragraph IWE-5221 to reestablish the leak-tight integrity of the containment metallic liner. Dominion proposes to perform a local leak rate test on the new pressure boundary weld of the containment metallic liner in lieu of the Type A test specified by ASME Section XI, paragraph IWE-5221 to re-establish containment integrity. In a November 27, 2002, telephone conference call, the NRC staff requested additional information to complete the review of the proposed alternative testing method.

To support the ongoing RVH replacement project and the scheduled restart of North Anna Unit 2 in January of 2003, Dominion requests approval of the proposed alternative by December 31, 2002. Please contact Mr. Thomas Shaub at (804) 273-2763, if there are any questions about this submittal.

Very truly yours,

E. S. Grecheck
Vice President – Nuclear Support Sevices

Attachments

Commitments made in this letter: None

A047

cc: U. S. Nuclear Regulatory Commission
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Attachment

Request for Additional Information
Alternative Test Requirements
for Containment Repairs

Virginia Electric and Power Company
(Dominion)
North Anna Power Station Unit 2

Request for Additional Information
Relief Request IWE-9

NRC Question 1:

Attachment welds are planned on the metallic liner to create channels for local leak rate testing and for construction aids during liner repair and concrete placement. Please provide more detail and drawings of the channels for the leak testing.

Dominion Response:

Attachment welds on the metallic liner are required to attach the leak chase channels to the liner. These leak chase channels will be used to perform a local leak rate test of the liner's repair weld. The local leak rate test will confirm the leak-tight integrity of the repair weld and the channel attachment welds.

Additional attachment welds on the metallic liner are required to attach construction aids to the liner. These construction aids include pads that will be permanently welded to the liner to support lifting rings and lugs. These lifting rings and lugs will be used to move the liner plate by crane from and to the opening. Other construction aids include fit-up devices (dogs) that will be tack welded to the liner and used to align the liner plate in the opening for rewelding. These fit-up devices will be removed after use, and the tack welds will be ground away. After the tack welds are removed, these areas will be examined by magnetic particle testing. Dominion plans to test those attachment welds that are not removed from the liner during the next scheduled leakage test of the pressure retaining boundary, as allowed by ASME Section XI, paragraph IWE-5222 and NEI 94-01, "Industry Guideline for Implementing Performance-Based Option of 10 CFR 50, Appendix J.

The enclosed drawings illustrate typical channels and construction aids.

NRC Question 2:

Dominion stated that the concrete will be replaced and will be tested in accordance with ASME Section XI, paragraph IWL-5500 as applicable. Could this be a typographical error for IWL-5000, as IWL-5500 is not part of the 1992 edition with the 1992 addendum.

Dominion Response:

This is a typographical error. The concrete will be replaced and tested in accordance with ASME Section XI, Subsections IWL-4000 and IWL-5000, respectively.

NRC Question 3:

The containment will be pressure tested at accident pressure to reestablish the structural integrity of the containment structure in accordance with paragraphs IWL-5220 and IWL-5250. Please address briefly the process of pressurizing and depressurizing the containment, how the test pressure is maintained, and what is the duration of the test. Describe the areas of concrete that are visually examined prior to testing, at test pressure, and following depressurization.

Dominion Response:

The responsible engineer will perform a 100% VT-1C examination of the exterior surface of the new concrete prior to, during, and following pressurization. Each examination is expected to be completed in 2 to 3 hours. A 100% VT-1C examination will be performed of the exterior surface of the new concrete prior to pressurization of the containment. Then, the containment will be pressurized to the test pressure through our purge supply ducting from external diesel driven air compressors (15,000 standard cubic feet per minute), at a rate not to exceed 10 psi/hr. The test pressure is P_a (44.1 to 45 psig). Once the test pressure is reached, it will be held for a minimum of one hour (this is consistent with the original pre-operational Structural Acceptance Test), and then the second 100% VT-1C examination of the exterior surface of the new concrete will be performed. During the "at pressure" examination, air will be added to the containment as required to maintain the pressure within specification. Once the "at pressure" examination is completed, the containment will be depressurized at a rate not to exceed 10 psi/hr until atmospheric conditions are achieved. After a one-hour wait, the final 100% VT-1C examination will be performed on the exterior surface of the new concrete.

NRC Question 4:

Dominion's acceptance criteria for leakage of the repair weld will be zero leakage. Please describe methods or procedures used to verify the zero leakage.

Dominion Response:

Prior to the containment pressure test described in the response to NRC Question 3, the metallic liner repair weld will be vacuum box tested, and the channel attachment welds will be snoop tested with soap bubbles. These tests will be performed prior to the local leak rate test.

After the containment pressure test is completed, an "as-left" local leak rate test of the welds will be performed. When the pre-operational test of the original leak chase channels and liner welds was conducted, the pressure decay method was used to perform the test. Although the specific method to be used for this project has not yet been finalized, the local leak rate test will meet the requirements of ANS 56.8. ANS 56.8, Section 6.1, "General Methods," states in part, "This section describes acceptable methods to determine the leakage rates of primary containment boundaries and isolation valves. Examples of some acceptable methods (but not limited to only those listed) for measuring leakage rates are: (1) Pressure decay and (2) Make-up flow rate...." Section 6.4.1, "Pressure Decay," states, "The test volume initially shall be pressurized with air or nitrogen to a test pressure greater than P_a. The final test pressure shall be greater than P_a. The pressure and temperature shall be recorded at the start and end of the test. The leakage rate shall be calculated from the following formula...." Section 6.4.2, "Make-up Flow-rate," states, "The test volume shall be pressurized and maintained to at least P_a using a pressure regulator to maintain test pressure. Makeup fluid flow to the test volume required to maintain test pressure shall be used as the leakage rate of the barrier under test...." Section 6.4.3 "Test Duration," states, "Pressure decay tests should have a test duration of not less than 15 minutes after stable conditions have been attained. A flow makeup test should be used if a pressure decay test cannot be performed for at least 15 minutes. No minimum test duration shall be required for a make-up flow test; however, test data shall be obtained during stable conditions."

Dominion considers the proposed local leak rate test to be a superior test for determining leakage at the repair weld, as compared to a Type A test, for the following reasons:

1. The local leak rate test will specifically test the liner repair weld area, which is the area of concern, and identify any leakage in that area. A Type A test measures total containment leakage. The scope of this project does not include any other work that would warrant a test of the entire containment.

2. The acceptance criterion for the local leak rate test will be zero leakage. This is a more stringent acceptance criterion than that of a Type A test. Therefore, if any leakage is discovered in the repair weld, it will be identified by the local leak rate test, and corrected.

3. The containment pressurization test, which is performed at P_a and prior to the final local leak rate test, will structurally test the metallic liner repair weld. If the induced stresses from this test cause a flaw to develop in the repair, the local leak rate test will identify the flaw, and it will be corrected.

4. The pre-test and post-test activities associated with a Type A test are far more involved and time consuming than the proposed local leak rate test, and the Type A test provides no additional quality or accuracy.

NRC Question 5:

What specific codes or standards will Dominion use for concrete placement and liner installation, including welding studs, seam welds, and preservice inspection? Subsection IWE-5000 is not specific in this area.

Dominion Response:

Dominion is in the process of finalizing the specific codes and standards that will be used for concrete placement and liner installation. The reconciliation of any differences from the original owner's requirements will be performed in accordance with ASME Section XI.

The standard that is relevant to our request for an alternative to the Type A test is the standard that will be used to perform the local leak rate test. As stated in the response to NRC Question 4, the local leak rate test will meet the requirements of ANS 56.8.

When the codes and standards for concrete placement and liner installation are finalized, we will inform the NRC Project Manager of the availability of this information for NRC review.

LINER PLATE RESTORATION PROCEDURE/SEQUENCE

1. Weld the cut section of the liner plate to insitu liner plate, at the temporary construction opening, with full penetration weld.

2. Perform Magnetic Particle Testing (MT) examination of the completed full penetration weld.

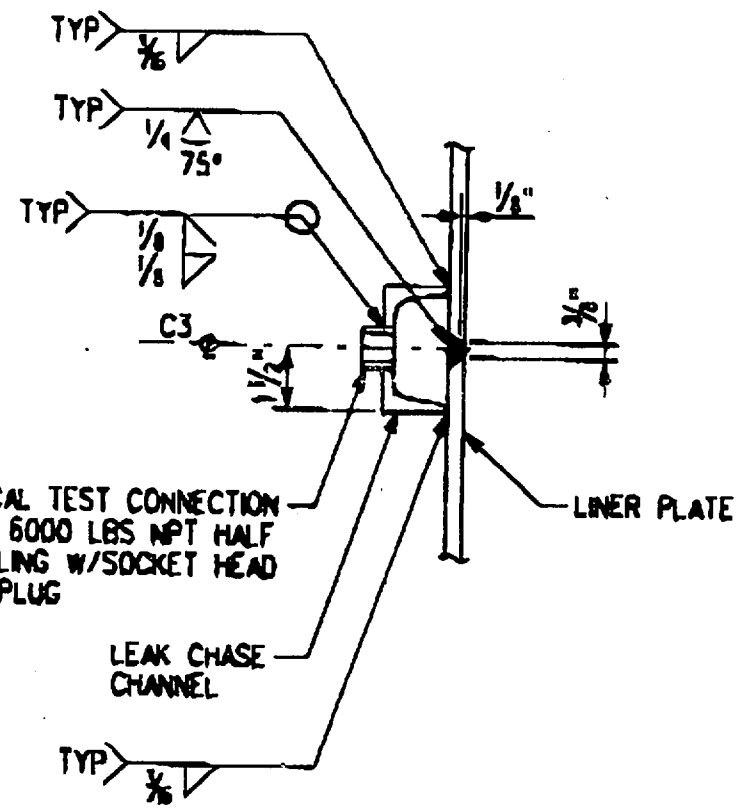
3. Perform vacuum box test on the completed full penetration weld.

4. Perform Radiographic Testing (RT) examination of the completed full penetration weld.

5. Seal/fillet weld leak chase channels centered over the perimeter of the full penetration liner plate weld.

6. Perform MT examination of the seal/fillet weld.

7. Pressurize the leak chase channels to 50 psi, and monitor for leakage. Repair leaking welds as necessary, and retest until no leakage is observed.



DETAIL FOR LINER PLATE WELDING
NTS

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:

DWG. NO.24841-120-C-104, REV. A

"REACTOR PRESSURE VESSEL HEAD REPLACEMENT PROJECT - CONTAINMENT STRUCTURE CONSTRUCTION OPENING LINER PLATE DETAILS"

WITHIN THIS PACKAGE...OR, BY SEARCHING USING THE DRAWING NUMBER: 24841-120-C-104

NOTE: Because of this page's large file size, it may be more convenient to copy the file to a local drive and use the Imaging (Wang) viewer, which can be accessed from the Programs/Accessories menu.