

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

April 30, 1990

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

Serial No. 90-247
PES/ISI/EWT R2
Docket Nos. 50-338
50-339
License Nos. NPF-4
NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNITS 1 AND 2
REQUEST FOR RELIEF FROM SECTION XI TESTING REQUIREMENTS
FOR THE OUTSIDE RECIRCULATION SPRAY PUMPS

A recent review of the North Anna Power Station ASME Section XI Inservice Testing Program for Pumps and Valves determined that the periodic surveillance test procedures for the outside recirculation spray pump tests are not consistent with the test description in the current Pump and Valve Inservice Testing Program. The inconsistency is based on possible adverse consequences not yet fully evaluated and certain ambiguities in the program test description that may have miscommunicated program intent. A discussion of the background, test descriptions and areas of concern, potential adverse consequences, corrective actions, and schedule for resolution are discussed below.

Revision 3 to the North Anna Pump and Valve Inservice Testing Program Plan had requested relief from the quarterly testing requirement for the outside recirculation spray pumps and alternately proposed a "wet bump" of the pumps be performed quarterly supplemented by a Section XI type test every eighteen months. Following discussions with the NRC on the North Anna Inservice Testing Program, Virginia Electric and Power Company submitted Revision 4 to the Pump and Valve Testing Program Plan for NRC review and approval on January 19, 1989. Revision 4 of the program changed the testing requirements specified for the outside recirculation spray pumps to quarterly testing in accordance with ASME Section XI. (Copies of the subject relief requests from Revisions 3 and 4 of the program plan are attached for your information.) Finally, on October 3, 1989, Revision 5 of the Pump and Valve Testing Program Plan was submitted to the NRC in response to Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," issued on April 3, 1989. There were no changes to the subject relief request from Revision 4 to Revision 5 of the program. Therefore, in accordance with the provisions provided in Generic Letter 89-04, the subject relief was considered approved by the NRC.

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Revision 4 (and subsequently Revision 5) of the program had changed the testing specified for the outside recirculation spray pumps and correspondingly Virginia Electric and Power Company committed to revise and implement the appropriate periodic test procedures by December 31, 1989. However, a recent inhouse review of the Inservice Testing Program determined that the periodic test procedures for the pump tests had not been completely revised in accordance with our commitments.

During the investigative evaluation resulting from the testing discrepancy, it was determined that, when Revision 4 of the program was prepared, the Company had intended to implement the Section XI testing on a quarterly basis for the outside recirculation spray pumps. However, during the program preparation review process, possible adverse consequences to the system and equipment resulting from the quarterly testing frequency were not fully evaluated and the Revision 4 relief request was ambiguous such that it allowed miscommunication of the testing program intent. During the resulting process of revising the quarterly test procedures to Section XI requirements, the issue of assessing the benefits versus the risks of performing the quarterly Section XI testing was identified by operations as needing further evaluation.

As part of the test discrepancy evaluation, several areas of concern are being evaluated. First, flow testing the pumps using the recirculation test loop produces a pressure surge which is linked to damage found in the expansion joint on the discharge side of the pump. (Note that for Surry Power Station, this expansion joint is downstream of the motor operated discharge isolation valve and is not subject to the pressure conditions inside the test loop.) Further investigation is necessary to determine if the test procedure can be changed to reduce the pressure surge. If the pressure surge cannot be reduced, the test frequency should be limited so that the damage to the expansion joint will be minimized. The second area of concern is whether the benefits of quarterly Section XI testing are outweighed by the risks of pump degradation through frequent testing of a system that is maintained dry during normal operation. Although the pumps were designed to be run dry ("dry bump"), the pumps are "wet bumped" to reduce the potential for bearing wear. A less frequent testing schedule may be more appropriate. The third concern is associated with the limited inventory within the test loop. During pump testing, the water tends to heat up quickly. If the pump is allowed to run too long, excessively high pressures can be produced in the closed test loop. Finally, Surry Power Station is performing the quarterly testing in accordance with ASME Section XI. We intend to fully evaluate the testing programs for these pumps so that a more common testing program may be implemented at both stations.

Our current quarterly periodic testing procedures for the outside recirculation spray pumps perform a "wet bump" test. The pumps are tested using a recirculation flow test path and the test quantities are measured immediately after the pumps are started. The test requires that pump rotation be verified and discharge pressure, flow rate, and vibration measurements be recorded. The quarterly test is terminated as soon as the test quantities are recorded. The current quarterly periodic testing procedures for the outside recirculation spray pumps are still the same as those implemented for Revision 3 of the program except that vibration measurements have been added. During the 18-month test, discharge pressure, flow rate, and vibration measurements will be recorded after the pump has run for five minutes as required by Section XI. These test

quantities will then be compared to the Section XI and Technical Specification acceptance criteria. Certain other Section XI required test parameters (i.e., inlet pressure, lube oil level or pressure, and bearing temperatures) will not be measured based on the justifications stated in the relief request.

It is our intent to complete the evaluation of our testing concerns and to determine if an alternate test procedure/schedule would be justified in light of the pump and test loop designs. Also, a comprehensive evaluation of our Inservice Testing Program is on-going to ensure that it is complete and accurate. The evaluation will be completed and our determination submitted to the NRC by June 14, 1990. In the interim, North Anna requests that the quarterly and 18-month tests described above be used until a revised relief request is approved by the NRC.

Should you have any questions or require additional information, please contact us at your earliest convenience.

Very truly yours,



W. L. Stewart
Senior Vice President - Nuclear

Attachments

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Mr. M. S. Lesser
NRC Senior Resident Inspector
North Anna Power Station

RELIEF REQUEST #7

PUMPS

- 1-RS-P-2A
- 1-RS-P-2B

SECTION XI REQUIREMENTS FOR WHICH RELIEF IS REQUESTED

1. Measure inlet pressure, differential pressure, flow rate and vibrations.
2. Measure lube oil level or pressure and bearing temperatures.

BASIS FOR RELIEF REQUEST

1. These pumps were designed to be periodically run dry for a short period of time to verify operability.
2. Proper lube oil level or pressure can not be observed because pump bearings are in the main flow path. IWP-4310 provides exemption from measuring bearing temperatures for bearings in the main flow path.

ALTERNATE TESTING

1. These pumps will be run wet to verify operability. These pumps were designed to run dry but in order to reduce the potential for bearing wear these pumps will be run wet. Pump rotation will be verified locally during each pump test. Each pump is equipped with a vibration detector and a high vibration alarm in the control room. This alarm will be observed during each pump test. These pumps will be tested on their recirculation paths at least once every 18 months. Discharge pressure, flow rate and vibration measurements will be taken. Inlet pressure will not be measured because no instrumentation is present. The recirculation path will be filled with water to establish initial conditions for testing.
2. NONE

RELIEF REQUEST P-7

I. IDENTIFICATION OF COMPONENTS

System : Recirculation Spray

Pump(s) : 1-RS-P-2A
1-RS-P-2B

Class : 2

II. IMPRACTICAL CODE REQUIREMENTS

Measure inlet pressure and differential pressure.

III. BASIS FOR RELIEF

These pumps were designed to be periodically run dry for a short period of time to verify operability.

IV. ALTERNATE TESTING

These pumps will be run wet to verify operability. These pumps were designed to run dry, but in order to reduce the potential for bearing wear, these pumps will be run wet. These pumps will be tested on their recirculation paths. Discharge pressure (instead of differential pressure), flow rate and vibration measurements will be taken at this time. The recirculation path will be filled with water to establish initial conditions for testing. Inlet pressure remains constant for the test loop from test to test.