

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

November 2, 1979

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
Attn: Mr. Darrel G. Eisenhut,  
Acting Director, Division of  
Operating Reactors  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Serial No. 825/092879  
PO/FHT:baw  
Docket Nos. 50-338  
50-339  
License No. NPF-4  
Permit No. CPPR-78

Subject: North Anna Power Station Units 1 and 2  
Auxiliary Feedwater System Requirements

Dear Mr. Denton:

In response to your letter of September 28, 1979, on the above subject, we are forwarding our responses to your short-term and long-term requirements in the attachment.

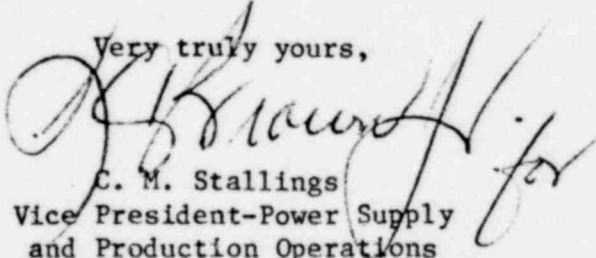
The System Description included as Enclosure 1 of your letter was reviewed and the following discrepancy should be noted. The turbine driven auxiliary feedwater pump has a design flow of 700 gpm as described in section 10.4.3 of the FSAR. However, the orifice does not limit flow to 350 gpm as described in Enclosure 1. The orifice in the 4 inch discharge line from the turbine driven pump is designed to control back pressure to prevent pump runout due to a down-stream pipe break. This is described in Comment 10.12 of the FSAR. The orifice is designed such that pump runout will not exceed 900 gpm.

It should also be noted that an additional supply of auxiliary feedwater supply is available from the Unit 2, 300,000 gallon non-seismic condensate make-up storage tank.

The information required to respond to Enclosure 2 of your letter, Basis for Auxiliary Feedwater System Flow Requirements, is being assembled at this time, and will be forwarded as soon as it is available.

If you have any questions, or require additional information, please contact this office.

Very truly yours,

  
C. M. Stallings  
Vice President-Power Supply  
and Production Operations

cc: Mr. James P. O'Reilly

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North Anna Power Station Units 1 and 2  
Auxiliary Feedwater System Requirements

A. Short Term Recommendations

1. Recommendation GS-4: Emergency procedures for transferring to an alternate source of AFW should be available to the plant operators.

Response: Abnormal Procedures will be developed to inform the operator when and in what order the transfer to alternate water sources should take place. These procedures will cover cases when the Emergency Condensate Storage Tank (ECST) is not initially available and cases when the ECST water supply is being depleted. Procedures will be developed prior to January 1, 1980.

2. Recommendation GS-6: The licensee should confirm flow path availability of an AFW system flow train that has been out of service to perform periodic testing or maintenance.

Response: Procedures will be modified to require an additional operator to independently verify that the AFW system valves are properly aligned. Present procedures already require one operator to verify that AFW system valves are properly aligned. Procedures will be modified prior to January 1, 1980.

Technical Specifications will be proposed to assure that prior to plant startup, following an extended cold shutdown, a flow test will be performed to verify the normal flow path from the ECST to the steam generators. The request for a Technical Specification change will be submitted to the NRC prior to January 1, 1980. Flow testing of the AFW system will be completed prior to entering MODE 2 following the present refueling outage.

3. Recommendation GS-7: The licensee should verify that the automatic start AFW signals and associated circuitry are safety grade.

Response: The licensee has verified that the automatic start AFW signals and associated circuitry are safety grade. The AFW system is initiated automatically by a safety injection signal, a loss of offsite power, or a low-low steam generator level. These actuation signals are testable and these signals are the system actuations on which the FSAR Chapter 15 accident analysis is based. The AFW system is also automatically initiated on loss of the main feedwater pumps in anticipation of low steam generator level. This anticipatory actuation is not testable during normal operation. All initiation signals and circuits are designed to prevent a single failure from causing a loss of the AFW system.

B. Additional Short-Term Recommendations

1. Recommendation: The licensee should provide redundant level indications and low level alarms in the control room for the AFW system primary water supply to allow the operator to anticipate the need to make up water or transfer to an alternate water supply and prevent low pump suction pressure conditions from occurring.

Response: The feedwater system provides the operator with indication of steam generator levels, ECST level, auxiliary feedwater pump suction pressure, auxiliary feedwater pump discharge pressures, and auxiliary feedwater pump flow. All of these indications are powered by an emergency power supply. The control switches for the remote control valves are located in Main Control Room (MCR) in the same general area as the feedwater system indicators. This arrangement allows one operator to easily monitor the system indicators while controlling AFW to the steam generators. The level transmitter for ECST provides indication in the MCR and at the Auxiliary Shutdown Panel. There is also a ECST level recorder in the MCR. A local indicator is also provided in the AFW pumphouse. These indicators are provided by one transmitter; however, a diverse method of monitoring ECST level is available by monitoring AFW pump suction pressure indicators. Local AFW pump suction pressure gauges are also available in the AFW pumphouse. Procedures will be modified by January 1, 1980 to instruct operating personnel to monitor both pump suction pressure indicators and ECST level indication.

The present system includes a low level alarm to alert the operator of a condition when ECST level is approaching the Technical Specification minimum. This allows the operator sufficient time to maintain the level above the minimum required. An additional low-low level is also available to alert the operator when make-up water from an alternate water supply is required. The low-low level alarm will allow more than 20 minutes for operator action with the largest capacity AFW pump (1-FW-P-2) operating. Because of the diverse monitoring of ECST level using one level and three different pump suction pressure indicators, no change is required to the present AFW design.

2. Recommendation: The licensee should perform a 72-hour endurance test on all AFW system pumps.

Response: The 72 hour endurance test as described in your recommendation has not been performed on the AFW pumps. Such a test is being considered and an evaluation of the capability of the recirculation lines to provide adequate flow for such a test is underway. The pump vendor is also investigating the feasibility of such a test.

The motor-driven pumps will be tested prior to unit startup by providing a temporary flow path if the recirculation path is inadequate. The steam-turbine-driven pump, however, cannot be tested until after unit start-up, when steam will be available. If the recirculation path for the steam-turbine-driven pump is inadequate for the endurance test, then a temporary flow path would have to be established. The testing of this pump with a temporary flow path would conflict with the requirements of Technical Specification 3.7.1.2., which states, in part, "At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be operable.....With one auxiliary feedwater pump inoperable, restore three auxiliary feedwater pumps..... to operable status within 72 hours or be in hot shutdown within the next 12 hours." Resolution of this conflict will be necessary if a temporary flow path is required to establish adequate recirculation flow for the 72 hour endurance test of the turbine-driven auxiliary feedwater pump.

3. Recommendation: The licensee should implement the following requirements as specified by item 2.1.7.b. on page A-32 of NUREG-0578.

Response: Modifications are presently underway to upgrade the safety-grade indication of AFW flow from semi-vital bus power to vital bus power. This modification will be completed before unit startup.

4. Recommendation: Licensees with plants which require local manual realignment of valves to conduct periodic tests on one AFW system train and which have only one remaining AFW train available for operation should propose Technical Specifications to provide that a dedicated individual who is in communication with the control room be stationed at the manual valves.

Response: Periodic testing does not require local manual realignment of valves. Also, there are three AFW trains available. Therefore, no further action is required.

C. Long Term Recommendation

1. Recommendation GL-5: The licensee should upgrade the AFW system automatic initiation signals and circuits to meet safety-grade requirements.

Response: The AFW system automatic initiation signals and circuits are presently designed to meet safety-grade requirements.