



Omaha Public Power District

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January 14, 1980

Mr. Darrell G. Eisenhut, Director
Division of Operating Reactors
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Reference: Docket No. 50-285

Dear Mr. Eisenhut:

The Omaha Public Power District received the Commission's letter of October 22, 1979, on the subject of NRC Requirements for Auxiliary Feedwater Systems at Fort Calhoun Station Unit No. 1. Enclosure 1 of the letter identified the Staff's requirements for the station. The enclosure to this letter itemizes those requirements and provides the District's implementation plans and schedules for each item.

Enclosure 2 of the Staff's letter will be addressed, as it applies to the safety grade automatic auxiliary feedwater system, under separate cover.

Sincerely,

W.C. Jones
W. C. Jones
Division Manager
Production Operations

WCJ/KJM/BJH:jmm

Enclosure

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Enclosure

X.3.3.1.1

Recommendation GS-2

The licensee should lock open single valves or multiple valves in series in the AFW system pump suction piping and lock open other single valves or multiple valves in series that could interrupt all AFW flow. Monthly inspections should be performed to verify that these valves are locked and in the open position. These inspections should be proposed for incorporation into the surveillance requirements of the plant Technical Specifications. See Recommendation GL-2 for the longer term resolution of this concern.

Response

The appropriate valves have been locked in the required position to insure a flow path to the steam generators.

An additional surveillance test is being prepared and will be implemented prior to startup from refueling (scheduled to commence January 18, 1980) to check the position of critical valves in the auxiliary feedwater system on a monthly basis.

An auxiliary feedwater system normal line up checklist has been completed to verify proper valve position. The District will perform these checks on a monthly basis during power operation until the above referenced surveillance test is implemented.

The proposed change to Technical Specification section 3.9 requiring the monthly surveillance test is attached to this enclosure. This change will be formally submitted under separate cover.

X.3.3.1.2

Recommendation GS-4

Emergency procedures for transferring to alternate sources of AFW supply should be available to the plant operators. These procedures should include criteria to inform the operator when, and in what order, the transfer to alternate water sources should take place. The following cases should be covered by the procedures:

The case in which the primary water supply is not initially available. The procedures for this case should include any operator action required to protect the AFW system pumps against self-damage before water flow is initiated; and

The case in which the primary water supply is being depleted. The procedure for this case should provide the transfer to the alternate water sources prior to draining of the primary water supply.

Response

The appropriate operating instructions and emergency procedures will be changed as necessary to incorporate the emergency sources of water for the emergency feedwater tank including criteria for when they will be used.

The procedures and associated training will be completed by the end of the 1980 refueling which will begin on January 18, 1980, with a plant startup scheduled for approximately March 15, 1980.

X.3.3.1.3

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 as follows:

Procedures should be implemented to require an operator to determine that the AFW system valves are properly aligned and a second operator to independently verify that the valves are properly aligned.

The licensee should propose Technical Specifications to assure that prior to plant startup following an extended cold shutdown, a flow test would be performed to verify the normal flow path from the primary AFW system water source to the steam generators. The flow test should be conducted with AFW system valves in their normal alignment.

Response

The current procedures for tagging equipment out of service at Fort Calhoun Station requires confirmation that a system is returned to service following maintenance. All valves are returned to their normal position.

The current maintenance order system at Fort Calhoun provides for verifying system operability at the completion of the maintenance task. This insures that the system is operable at that time.

A second independent verification of valve position will be provided on the monthly test proposed in X.3.3.1.1. Performance of the surveillance test following maintenance on the auxiliary feedwater system will be required.

Technical Specifications requiring a flow test to verify the normal flow path after a cold shutdown are attached. These specifications will be formally submitted under separate cover.

X.3.3.1.4

Recommendation GS-7

The licensee should verify that the automatic start AFW system signals and associated circuitry are safety-grade. If this cannot be verified, the AFW system automatic initiation system should be modified in the short-term to meet the functional requirements listed below. For the longer term, the automatic initiation signals and circuits should be upgraded to meet safety-grade requirements as indicated in Recommendation GL-5.

The design should provide for the automatic initiation of the auxiliary feedwater system flow.

The automatic initiation signals and circuits should be designed so that a single failure will not result in the loss of auxiliary feedwater system function.

Testability of the initiation signals and circuits shall be a feature of the design.

The initiation signals and circuits should be powered from the emergency buses.

Manual capability to initiate the auxiliary feedwater system from the control room should be retained and should be implemented so that a single failure in the manual circuits will not result in the loss of system function.

The alternating current motor-driven pumps and valves in the auxiliary feedwater system should be included in the automatic actuation (simultaneous and/or sequential) of the loads to the emergency buses.

The automatic initiation signals and circuits shall be designed so that their failure will not result in the loss of manual capability to initiate the AFW system from the control room.

Response

This item is discussed in the Omaha Public Power District's response to NUREG-0578, item 2.1.7.a, dated December 31, 1979.

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X.3.3.1.5

The licensee should prepare a procedure that assures that the operator manually connects the motor-driven pump train to the bus powered by the emergency diesel generator following loss of offsite power.

Response

This item is discussed in the Omaha Public Power District's response to NUREG-0578, item 2.1.7.a, dated December 31, 1979.

X.3.3.1.6

Since valves FW 744 and 745 in one of the AFW pump discharge headers are normally open, a postulated break in this header would cause loss of the capability to provide AFW flow to both steam generators. The licensee should re-evaluate the position of these valves considering such a postulated pipe break to revise the valve alignment to reduce the impact of such an event on the AFW capability (e.g., close valves FW 744 and FW 745).

Response

The valves FW-744 and FW-745 will be normally maintained in the closed position to mitigate the consequences of a pipe break between FW-744, FW-745, and FW-746.

These valves will be placed in the closed position by January 21, 1980.

X.3.3.2.1

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 a low pump suction pressure condition from occurring. The low level alarm setpoint should allow at least 20 minutes for operator action, assuming that the largest capacity AFW pump is operating.

Response

To meet the requirements of this item, an additional level transmitter, level indicator, and associated alarm will be added to the AFW system primary water supply during the 1980 refueling outage, scheduled to commence January 18, 1980. The alarm setpoint will be set to allow at least 20 minutes for operator action. The above system will provide a control grade redundant level indication and low level alarm to the AFW system primary water supply.

X.3.3.2.2

Recommendation

The licensee should perform a 72-hour endurance test on all AFW system pumps, if such a test or continuous period of operation has not been accomplished to date. Following the 72-hour pump run, the pumps should be shutdown and cooled down and then restarted and run for one hour. Test acceptance criteria should include demonstrating that the pumps remain within design limits with respect to bearing/bearing oil temperatures and vibration and that pump room ambient conditions (temperature, humidity) do not exceed environmental qualification limits for safety-related equipment in the room.

Response

The feedwater water system was tested as per the recommendations of X.3.3.2.2. Both pumps were found to satisfactorily complete the requirements of the S.E.R. Bulletin and all operating parameters remained within design limits. Pump test data is available at the Fort Calhoun Station for review.

Specific Data:

SP-ENDURO-1 (72 Hour Endurance Test of FW-6)

Pump was started on 0212 12/20/79
Pump was stopped on 0230 12/23/79
Pump was restarted on 0840 12/23/79

The unit was run for one hour after 72 hours to prove operability. During the test, the following were monitored: motor current, pump suction, discharge pressure temperature and vibration.

SP-ENDURO-2 (72 Hour Endurance Test of FW-10)

Pump was started on 1652 12/29/79
Pump was stopped on 1701 1/1/80
Pump was restarted on 1335 1/2/80

The unit was run for one hour after 72 hours to prove operability. During the test, the following were monitored: pump suction and discharge, turbine oil temperature and pressure, steam supply pressure and various temperature and vibration observations.

X.3.3.2.3

Recommendation

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

"Safety-grade indication of auxiliary feedwater flow to each steam generator shall be provided in the control room."

"The auxiliary feedwater flow instrument channels shall be powered from the emergency buses consistent with satisfying the emergency power diversity requirements for the auxiliary feedwater system set forth in Auxiliary Systems Branch Technical Position 10-1 of the Standard Review Plan, Section 10.4.9."

Response

This item is discussed in the District's response to NUREG-0578, item 2.1.7.b, dated December 31, 1979.

X.3.3.2.4

Recommendation

Licensees with plants which require local manual realignment of valves to conduct periodic tests on one AFW system train, and there is 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. Upon instruction from the control room, this operator would realign the valves in the AFW system train from the test mode to its operational alignment.

Response

Local manual realignment of valves is not required to perform the present periodic testing requirements of the auxiliary feed-water system; therefore, no Technical Specification changes are proposed.

X.3.3.3.1

Recommendation GL-1

Licensees with plants having a manual starting AFW system should install a system to automatically initiate the AFW system flow. This system and associated automatic initiation signals should be designed and installed to meet safety-grade requirements. Manual AFW system start and control capability should be retained with manual start serving as backup to automatic AFW system initiation. (Note: This recommendation is applicable to the motor-driven AFW pump subsystem upon the loss of offsite AC power.)

Response

This item is discussed in the District's response to NUREG-0578, item 2.1.7.a, dated December 31, 1979.

X.3.3.3.2

Recommendation GL-2

Licensees with plants in which all (primary and alternate) water supplies to the AFW systems pass through valves in a single flow path should install redundant parallel flow paths (piping and valves).

Response

The Fort Calhoun Station currently utilizes a single header from water supplies to the AFW pumps suction. Redundant parallel flow paths will be installed during the 1981 refueling outage, scheduled to commence in March, 1981. A design description will be submitted to the Commission for review by September, 1980.

X.3.3.3.3

Recommendation GL-5

The licensee should upgrade the AFW system automatic initiation signals and circuits to meet safety-grade requirements.

Response

This item is discussed in the District's response to NUREG-0578, item 2.1.7.a, dated December 31, 1979.

X.3.3.3.4

Recommendation

The licensee should evaluate the following concerns:

- a. The discharge lines of both AFW pumps combine into a single header through which all AFW water must flow. A pipe break in this single flow path could result in the loss of the entire AFW system function.
- b. The Fort Calhoun AFW system design does not meet the high energy line break criteria in SRP 10.4.9 and Branch Technical Position 10-1; namely, that the AFW system should maintain the capability to supply the required AFW flow to the steam generator(s) assuming a pipe break anywhere in the AFW pump discharge lines concurrent with a single active failure.

The licensee should evaluate the postulated pipe breaks stated above and (1) determine any AFW system design changes or procedures necessary to detect and isolate the break and direct the required feedwater flow to the steam generator(s) before they boil dry or (2) describe how the plant can be brought to a safe shutdown condition by use of other systems which would be available following such postulated events.

Response

- a. The discharges from the two auxiliary feedwater pumps do combine into a single header for feeding the steam generators through the auxiliary feedwater nozzles. It is not believed, however, that a break in this header would result in the total loss of auxiliary feedwater system function. If a break occurs in this common header, it can be isolated by the closure of the following valves:

HCV-1107A and/or B
HCV-1108A and/or B
HCV-1384 and/or FW-169 and/or FW-170
FW-172

Valves FW-744, 745, and 746 would then be opened, and auxiliary feedwater would flow into the steam generators through the main feedwater lines; using either FCV-1101 and 1102 or the bypass valves, HCV-1105 and 1106.

Main feedwater isolation valves HCV-1385 and 1386 are closed by the Containment Isolation Actuation Signal (CIAS). If it became necessary to use the main feedwater system and CIAS occurred, the CIAS closure of HCV-1385 and 1386 would be overridden.

Evaluation of this concern will continue, and the results of the completed evaluation will be submitted to the Commission by September, 1980.

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- b. This concern will be evaluated with results of the completed evaluation submitted to the Commission by September, 1980.

D R A F T

Proposed Technical Specifications

- 3.9) The position of valves necessary to ensure auxiliary feedwater flow to the Steam Generators should be verified by a monthly inspection. Manual valves which could interrupt auxiliary feedwater flow to the steam generators should be locked in the desired position.

This verification of valve alignments will be independently verified whenever maintenance is performed on the auxiliary feedwater system.

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3.9a Prior to exceeding 300°F the electric driven auxiliary feedwater pump will be tested to verify the normal flow path for auxiliary feedwater to the steam generators.