

## MINNEAPOLIS, MINNESOTA 55401

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# NORTHERN STATES POWER COMPANY

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The purpose of this letter is to address each of these open items and provide sufficient information for the NRC Staff to complete their safety evaluation of the Prairie Island auxiliary feedwater system. Each of these items is addressed below and in the attached material.

## Recommendations GS-1, Auxiliary Feedwater (AFW) Technical Specifications

In a License Amendment Request dated December 31, 1979 Northern States Power Company proposed revised Limiting Conditions for Operation and Surveillance Requirements for the auxiliary feedwater system. NRC Staff review of the proposed changes resulted in the conclusion that a 72 hour period of pump inoperability is the maximum that will be allowed.

### Response

This subject has been discussed with the Prairie Island Licensing Project Manager in the Division of Licensing. Northern States Power Company will accept this change.

## Additional Short Term Recommendation (1), AFW Primary Water Supply

NRC Staff review of information provided by NSP on November 21, 1979 resulted in a request for information in five areas:

- a. Information to verify that the level indicators and the high/low level alarms are available to control room operators of both units.
- b. Verification that the instrumentation is redundant and separated all the way from the detectors at the condensate storage tanks to the readouts and alarms in the control room.
- c. Verification that the systems are powered from redundant power sources with one train having a back-up battery source.
- d. Verification that inadvertent valve closure in a common header will not defeat the redundancy of the condensate storage tank high/low level alarms and level indicators.
- e. Aside from short time intervals for reasons such as maintenance, verification that the valves joining the condensate tanks to the common header will be in the open position while the reactor is in the power operating range.

### Response

- a. A design change has been completed (79L566) to provide redundant low level alarms for both units. The high/low level bistable for each unit has been converted to a dual low level bistable. Low level signals are provided to both Unit No. 1 and Unit No. 2 annunciator alarms from each level bistable. The bistables have been calibrated such that

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the alarm occurs when condensate storage tank level drops below 12 inches corresponding to over 9000 gallons of water per tank. This would provide operators with at least 20 minutes of reaction time to line up alternate sources of water.

- b. One level transmitter is installed on No. 11 condensate storage tank and one level transmitter is installed on No. 12 condensate storage tank. These devices are well separated physically.

No cable separation criteria was specified for these instruments during plant construction. A review of the circuit schedule for the cables, however, indicates that they are routed in separate raceways with the exception of common routing in three segments of one tray between the control room and relay-cable spreading room.

- c. Both level channels are powered from instrument inverters. These inverters are supplied from the Class IE DC battery system.
- d. When the manual cross-tie valve between the Unit No. 1 and Unit no. 2 condensate storage tanks is closed, each level transmitter responds to its associated tank(s).
- e. Valves joining the condensate storage tanks to the auxiliary feedwater pump suction header, as well as the two valves cross connecting the Unit No. 1 and Unit No. 2 condensate storage tanks, are verified to be correctly positioned during the pre-startup valve lineup check of the condensate system.

## Additional Short Term Recommendation (2), AFW Pump 48-Hour Test

The NRC Staff requires completion of a 48-hour endurance test. Test criteria should include demonstrating that the pumps remain within design limits with respect to bearing and oil temperatures and vibration and that pump room ambient conditions do not exceed environmental qualification limits for safety related equipment in the room.

## Response

The required tests have been completed. A copy of the test report is provided in Attachment (1).

## Additional Short Term Recommendation (3), AFW Flow-Indication

The NRC Staff requires reliable indication of auxiliary feedwater flow to each steam generator in the control room. The latest requirements are provided in NUREG-0737, Item II.E.1.2 (Part 2).

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## Response

As described in our letter dated November 21, 1979 each steam generator is provided with control grade auxiliary feedwater flow indication in the control room. This indication is powered by safeguards power supplies. Flow channel electrical components are not located where they would be subject to a harsh accident environment.

As described in our letter dated December 18, 1980 each steam generator has four level channels (3 narrow and 1 wide range). Each channel is powered from a safeguards power supply. Wide range indication is available in both the control room and the hot shutdown panel.

We believe the instrumentation meets the clarification specified in NUREG-0737, Item II.E.1.2 (Part 2), for Westinghouse plants. Flow indication is of secondary importance for assuring the heat removal capability of plants provided with U-tube steam generators. No further modifications are believed to be required to satisfy NRC Staff requirements in this area.

## Long Term Recommendation GL-3, Independence of AC Power

The NRC Staff specifies at least one auxiliary feedwater system pump and its associated flow path and essential instrumentation should automatically initiate AFW system flow and be capable of being operated independently of any AC power source for at least two hours.

## Response

Design Change E-80Y129 has been initiated to free the turbine driven auxiliary feedwater pump from the need for AC power. This change will be completed at the first refueling outage following receipt of necessary materials.

A summary of the design change is provided in Attachment (2).

## Long Term Recommendation GL-4, Suction Protection for AFW Pumps

The NRC Staff requires that procedures be available for switching to a seismic Class I water supply. Protection of the pumps in the event of loss of water supply or isolation of the pump suction must also be provided.

## Response

As stated in our letter dated December 18, 1980 procedures have been modified to provide for prevention of pump damage and transfer to alternate water supplies.

Design Change 80L579 has been initiated to provide suction protection for the auxiliary feedwater pumps. This modification will protect the pumps from a loss of suction. This change will be completed at the first refueling outage following receipt of necessary materials.

A summary of the design change is provided in Attachment (3).

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Long Term Recommendation GL-5, Safety Grade Automatic Initiation

The NRC Staff requires that safety grade automatic initiation circuitry be provided for the auxiliary feedwater system. The latest requirements are provided in NUREC-0737, Item II.E.1.2 (Part 1).

Response

Documentation of the reliability of the automatic actuation circuitry for the Prairie Island auxiliary feedwater system has been provided to the NRC Staff for their review in correspondence dated November 21, 1979, December 28, 1979 (including schematics), and December 18, 1980. We believe that Staff review of this material will conclude no additional modifications to the actuation circuitry for the auxiliary feedwater system are necessary.

Additional material will be submitted for NRC Staff review on request.

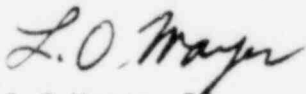
Enclosure (2) to NRC Letter dated October 16, 1979, Auxiliary Feedwater System Flow Basis

Enclosure (2) to the letter from D G Eisenhut dated October 16, 1979 was a generic request for additional information regarding auxiliary feedwater system flow requirements.

Response

The evaluation required by Enclosure (2) to Mr Eisenhut's letter has been completed by Westinghouse for the Prairie Island plant. A copy is provided in Attachment (4).

Please contact us if you have any questions concerning the information we have provided.



L O Mayer, PE  
Manager of Nuclear Support Services

LOM/DMM/jh

cc J G Keppler  
NRC Resident Inspector  
G Charnoff

Attachments

Attachments  
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Attachment 1	Auxiliary Feedwater Pump Endurance Test
Attachment 2	Turbine-Driven Auxiliary Feedwater Pump AC Independence Design Change
Attachment 3	Auxiliary Feedwater Pump Suction Pressure Protection Design Change
Attachment 4	Basis for Auxiliary Feedwater System Flow Requirements