

UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

SEP 27 1973

Files (Docket No. 50-263)

THRU: D. L. Ziemann, Chief, ORB #2, L

*D.L. Ziemann*  
FLOODING OF CRITICAL EQUIPMENT AT MONTICELLO (NORTHERN STATES POWER COMPANY)

Northern States Power Company (NSP) has responded (ref. 2, 4, and 5) to our concern (ref. 1 and 3) for the possibility that flooding could prevent safe shutdown of the reactor or prevent engineered safety systems from performing their emergency function following postulated accidents. Thirteen non-Class I systems with some potential for flooding have been identified by NSP and the consequences of their failure have been evaluated.

We have reviewed the information presented by NSP claiming that (1) emergency power to engineered safety systems is available from two independent sources, one located at the 911 ft elevation and the other at the 931 ft level in the turbine building, and (2) there is adequate separation of redundant components of safeguards equipment so that no single failure of non-Class I piping could prevent safe reactor shutdown or emergency core cooling, except for a feedwater line break in the east side of the turbine building, that could simultaneously damage redundant MCCs. The elevation differences between redundant emergency power sources prevent simultaneous loss of emergency power due to a single flooding or spray incident. Corrective action, to be described later in the "High Energy Line Failure" report, will be taken by NSP to prevent feedwater line break. On this basis, we have concluded that no single pipe failure with resultant water flooding will prevent safe reactor shutdown or cause the loss of redundant engineered safety systems,

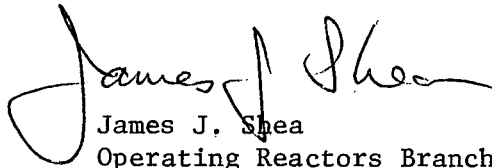
We concur with NSP plans to provide: (1) flood probes in the condenser hotwell area and in the circulating water pump bay with alarms in the control room and automatic circulating water pump trip, and (2) horizontal restraint for the condensate transfer line in the RHR-CSS pump rooms to withstand the safe shutdown earthquake. The planned modifications to provide additional flood protection and pipe restraint, we agree, will reduce the potential for adverse interactions with the engineered safety systems or the HPCI. According to NSP, these modifications

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will be completed prior to the end of the 1975 refueling outage. We consider this to be a reasonable and acceptable time for completion of the modifications since the modifications are not necessary (but desirable) to satisfy the requirements for safe reactor shutdown and engineered safety system redundancy.

Modifications to the feedwater system will be reviewed as part of the "Postulated Pipe Failures Outside Containment" evaluation recently submitted by NSP letter dated September 7, 1973.



James J. Shea  
Operating Reactors Branch #2  
Directorate of Licensing

Enclosure;  
References

cc w/enclosure;  
Northern States Power Company  
AEC PDR  
Local PDR  
DJSkovholt, L:OR  
TJCarter, L:OR  
DLZiemann, L:ORB #2  
JJShea, L:ORB #2  
JIRiesland, L:ORB #2  
RMDiggs, L:ORB #2

#### REFERENCES

1. Letter from D. Skovholt to NSP dated August 3, 1972 - "Flooding of Critical Equipment".

A failure of an expansion bellows in the circulating water line of the Quad-Cities Unit 1 main condenser caused flooding and degradation of some engineered safety features. NSP was requested to evaluate the potential for flooding in equipment that does not meet Class I seismic construction which could result in common mode failure of redundant safety related equipment.

2. NSP letter to D. Skovholt dated September 28, 1972.

The NSP response to the August 3, 1972 AEC request for reevaluation of flood potential noted that (1) the Monticello circulating water system does not have a flow reversal capability and therefore joints in the circulating water system cannot fail for the reason reported for Quad-Cities Unit 1, (2) if flooding should occur there is no possibility of common mode failure of redundant systems due to elevation differences, (3) the need for upgrading the flood detection capability is currently being evaluated by NSP, and (4) investigations are underway to identify means of further reducing the potential of adverse interactions with essential equipment due to failure of Class II piping. The condensate storage and transfer system is of particular interest.

3. Letter from D. L. Ziemann to NSP dated June 25, 1973.

AEC request for (1) results of investigations for improving flood detection and further reducing the potential of adverse interactions with essential equipment, and (2) evaluation of AEC "Guidelines for Protection from Flooding of Equipment Important to Safety" attached to the AEC letter.

4. NSP letter to D. L. Ziemann dated August 24, 1973.

NSP responded to the June 25, 1973 AEC letter that (1) a single horizontal restraint will be installed on a section of the condensate transfer line in the HPCI room, (2) flood probes will be installed

in the circulating river water pump bay to trip the pump(s) on high water level, and (3) corrective actions in the event of the feedwater line break in the east side of the turbine building will be addressed in the report regarding high energy line failures. (See NSP letter dated September 7, 1973.)

- 5, NSP letter to D. L. Ziemann dated September 10, 1973.

NSP claims that the investigations reported in the NSP August 24, 1973 letter (ref. 4 above) covered each of the AEC guidelines as they apply to the specific Monticello design.