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DESCRIPTION:
Ltr re our 8-3-72 ltr...furnishing results of investigation regarding potential flood at Monticello....(re..Quad-Cities Unit # 1 flooding incident).

ENCLOSURES:

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ACKNOWLEDGED DO NOT REMOVE

PLANT NAMES: Monticello Nuclear Generating Plant.

FOR ACTION/INFORMATION 10-2-72 fod

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NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

September 28, 1972

Mr. Donald J Skovholt
Assistant Director for Operating Reactors
Directorate of Licensing
United States Atomic Energy Commission
Washington, D C 20545

Dear Mr. Skovholt:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

In response to your inquiry of August 3, 1972 relating to the flooding incident at Quad Cities Unit 1, we have investigated the potential for like flooding at Monticello. In addition, we have evaluated Monticello in accordance with your request.

In general, no significant flooding hazard exists in either the reactor building or the turbine building above reactor building grade level, elevation 930' msl. Of primary concern, however, is a potential breach of the circulating water system below grade. The Monticello circulating water system utilizes rubber expansion joints at four locations on each of the two lines. Three of these joints are in locations potentially vulnerable to flood damage; i.e., the circulating water pump discharge located in the intake structure, and the condenser inlets and outlets located at elevation 911' msl in the turbine building. The probability of failure of one of these joints, via the mechanism reported at Quad Cities Unit 1, does not exist, since the Monticello circulating water system does not have a flow reversal capability. If a break in a circulating water line should occur, however, there are presently no positive barriers which could localize flooding. It must be assumed that water would propagate to other areas in the turbine building basement. Some emergency load centers are located on the 911' elevation. In all cases, however, load centers for the redundant systems are provided on elevation 931. There is no possibility of common-mode failure of redundant systems occurring as a result of flooding from the circulating water system.

The intake structure is connected to the turbine building by a Class I piping tunnel at elevation 916' msl. The RHR Service Water piping extends through a slot cut, at elevation 924', through a Class I barrier near the turbine building end of the pipe tunnel. With a circulating pipe break, the water level in the turbine building has been conservatively estimated to increase at a rate of approximately one foot per minute assuming both circulating water pumps continue in operation. The flooding would have to continue unabated for more than

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13 minutes without detection before it would begin to spill into the intake structure side of the barrier. At present, the sump in the condenser hot well area is equipped with a level alarm that would prompt immediate operator investigation. In addition, consideration is being given to upgrading the capability for gross flood detection in this area. A review of the need for this capability is currently in progress.

Some safeguards cooling water equipment is located on the operating floor of the intake structure at elevation 919' msl. The circulating water pumps are located in a bay (floor elevation 899' msl) open to the remainder of intake structure. As was noted earlier, rubber expansion bellows are located at the pump discharge. As the system is currently being operated, if one of these bellows failed, flood levels in the pump bay are limited by the river level which is nominally at elevation 910' msl. When the system is run closed cycle, however, flood levels due to this type of break are increased but are limited to the maximum water level in the cooling tower basin, elevation 918' msl. In addition, since the circulating water pumps will be flooded before other pumps in the intake structure and will trip, flow will be gravity forced and the level will increase slowly. An overflow is provided in the pump-house structure at elevation 916'.

Major Class II piping systems are summarized in the FSAR. Lines from these systems are located in many areas of the plant including areas housing essential equipment. A review of these systems has been made. In general the lines are isolatable and are not of sufficient capacity to cause more than localized flooding damage; in no case are there situations where common mode failures of redundant systems could reasonably be expected. Investigations are currently underway to identify means of further reducing the potential for adverse interactions with essential equipment. Lines are being treated on an individual basis. Of particular interest is the condensate storage and transfer system.

Class II lines from the condensate storage tanks are extended to all ECCS compartments. The capacity of the tanks is sufficient to flood any one of the ECCS compartments. Investigations are currently in progress to determine the feasibility of reanalyzing the condensate transfer line sections for the forces of a Design Basis Earthquake with the intent of eventually upgrading them to Class I equivalent. Both RHR rooms are presently equipped with high water levels probes which indicate water levels in excess of approximately one foot. Annunciation is made in the control room. The potential for coincident flooding is extremely low with the layout of the torus cavity and ECCS rooms at Monticello. The ECCS equipment are housed in separate individual rooms and are not freely communicated with the torus cavity.

It is our conclusion that common-mode failure of redundant equipment will not occur as a result of failure of Class II equipment. This review has identified means of improving protection levels. Plant operators will be briefed on present flooding procedures. It is our conclusion that events of this type are of sufficiently low probability to pose no significant hazard to continued operation.

Yours very truly,

L. O. Mayer

L O Mayer, P.E.
Director of Nuclear Support Services

LOM/DWJ/br

cc: B H Grier