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NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

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March 16, 1978

Director of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

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

Response to 3/14/78 Questions on HDFSS

On March 14, 1978, we met with members of your Staff to discuss details of the Monticello High Density Fuel Storage System (HDFSS). This subject was initially addressed in an August 17, 1977 submittal entitled, "Design Report and Safety Evaluation for Replacement of Spent Fuel Pool Storage Racks". At our meeting we were asked to document certain information which is presented below.

The document referenced above states that installation of the HDFSS involves a modification of control rod blade storage. Sufficient storage spaces will be provided for the 121 control rod blades used in the Monticello reactor. Two of the existing storage racks will remain having a capacity for 20 blades. In addition, control rod storage hangers will be provided but will not be utilized unless a large number of control rod blades must be removed and stored. The need to remove all control rod blades from the reactor is highly unusual. The new control blades storage hangers will be suspended from the spent fuel pool curb or from the equipment railings, locating the control rod blades in the peripheral gap between the pool wall and the new fuel storage modules. Use of the control rod storage hangers has been evaluated and found to involve no unreviewed safety questions. The drop of a fuel assembly from 25 inches over the HDFSS has previously been analyzed and documented. The energy imparted in such an event exceeds that potentially imparted by a dropped control rod blade or that of any other object handled in the spent fuel pool over an HDFSS module containing fuel.

The structural capacity of the spent fuel pool floor was reanalyzed for the HDFSS and found acceptable. The design floor loading of the spent fuel pool was originally 2.0 ksf. Since the fully loaded HDFSS floor loading is 2.1 ksf, the structure was reanalyzed for a selected design floor loading of 2.7 ksf. The strength of concrete for the Monticello spent fuel pool has increased due to aging. Based on the Concrete

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Manual of Bureau of Reclamation, 8th Edition, 1975, the Type II Portland Cement used at Monticello with a design strength of 4.0 ksi has a five year strength of 6.4 ksi. (The aged strength value used in the analysis is still less than the laboratory tests of 90 day strength which ranged from 6.57 to 7.12 ksi for samples of the spent fuel pool floor.) The pool floor slab was reanalyzed as a one-way slab for the new floor loads, including bending moment and shear, and found acceptable for the new design floor capacity of 2.7 ksf using a concrete strength of 6.4 ksi.

Our schedule for the HDFSS modification remains as stated in our Design Report of last August. Work will be ready to commence on April 1, 1978. We trust that this information will allow you to complete your review in a timely manner.



L O Mayer, PE
Manager of Nuclear Support Services

LOM/deh

cc: J G Keppler
G Charnoff