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Mr. Victor Stello

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Ltr re their 1/26/76 & 6/9/75 ltrs.....  
furnishing supplementary information to  
1/26/76 license amdt. request regarding the  
Control Rod Drive exercise surveillance.

(3-P)

PLANT NAME:  
Monticello

ENCLOSURE

ACKNOWLEDGED

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CONTROL NUMBER

6762

# NSP

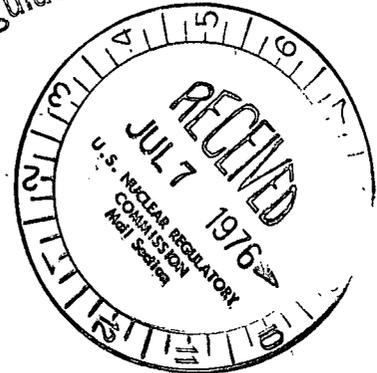
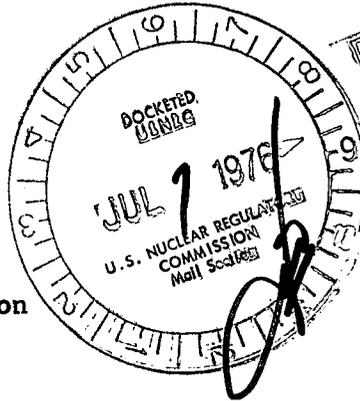
NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

Regulatory Docket File

July 2, 1976

Mr Victor Stello, Director  
Division of Operating Reactors  
U S Nuclear Regulatory Commission  
Washington, DC 20555



Dear Mr Stello:

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

Supplementary Information to 1/26/76 License Amendment Request

We understand from verbal contacts with your staff that questions have arisen concerning our January 26, 1976 License Amendment Request which superseded the initial License Amendment Request dated June 9, 1975. This request proposes that the control rod drive (CRD) exercise surveillance required by Technical Specifications be changed from weekly to monthly. General Electric has stated their position as follows:

"Historically, CRD exercising was first proposed at Dresden 1 and was instituted on a daily basis. The initial intent was to prevent crevice corrosion in the drive, especially in the metallic surfaces in contact with the seals. It was recognized, however, that this operation was also a valuable check on drive condition and hydraulic system continuity. The original exercising requirements were specified in instruction books, not in technical specifications.

Early in the 1960's, an analysis was made on the scram mode reliability based on the system readiness logic, i.e., instrumented accumulator energy storage plus tested scram valves plus low friction drive line and hydraulic lines intact (as demonstrated by the periodic exercising test). The analysis indicated that with these conditions satisfied, a satisfactory scram would occur. This emphasized the safety aspects of this test, because it verified a moving drive line which is probably why the exercising requirement moved from the Instruction Books into the Technical Specifications. However, this emphasis may have caused us to lose sight of the corrosion prevention aspect. With the introduction of nitrided parts, which are used at Monticello, the prevention of corrosion became significant.

Experience indicates that crevice corrosion exists on drives which remain in a given position for long periods of time. A number of index tubes have had to be replaced because these tubes had pitting in the seal contact area corresponding to the full-in drive position. These

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index tubes were from drives that had been in the full-in position for most of a fuel cycle and were not exercised. This experience indicates the need for exercising all drives, even those in the full-in position.

There is no corrosion data available at this time to provide a basis to lengthen the weekly surveillance frequency. GE recommends that a lead plant be selected to develop the data base necessary to support a lengthening of the time interval. This lead plant should give preference to those CRD's exercised least when selecting the sample of drives for the normal preventive maintenance program to provide the data base to support a longer surveillance interval."

A number of points raised in this generic position should be discussed individually as they apply to Monticello. There has been no pitting observed at Monticello that can be attributed to crevice corrosion. Should seal deterioration occur, the result may be higher stall flows and slower scram times. However, experience has shown that the CRD's performance in the "notch in" and "notch out" modes of operation would be noticeably affected before a significant effect on scram times would be observed.

Since there are Technical Specification limits and surveillance requirements on scram times, the safety aspects of seal performance are assured. Should lack of control rod exercising result in more frequent CRD maintenance, the choice between exercise frequency and maintenance becomes an economic decision rather than a safety decision, and therefore should not be a Technical Specification consideration. We are very concerned with seal performance from both the operational safety and economic viewpoint.

Our major reason for initially pursuing the change in exercise frequency was to avoid fuel failures in the initial core fuel and loss of plant capacity. Having since replaced all initial core fuel with fuel of an improved design, we now are attempting to minimize fuel duty on the improved replacement fuel as much as possible. Based upon this desire, we believe it prudent to continue to pursue the Technical Specification change. We believe that the safety aspects of a periodic operability demonstration are addressed in our January 1976 submittal, which conservatively quantifies a reasonable exercise frequency as being once per month.

As discussed in the detailed safety evaluation that accompanied the amendment request, the Monticello control rod drives are of the same General Electric design as those at other plants where cracks have been discovered in the collet retainer tubes (CRT). It should be emphasized that (1) no cracks have been observed at Monticello; (2) observed cracks at other plants have not resulted in a single inoperable drive; and (3) in simulated environmental tests, control rods with cracked CRT's have undergone more hot scrams (by a factor of 9.7) than anticipated in the life of a reactor without the failure to operate. The fact remains that if a control rod drive became inoperable due to a complete severance of CRT, it would be discovered with the periodic surveillance exercising. Because of the standard technical specification requirement for weekly control rod exercising of partially or fully withdrawn operable control rods, it has become common practice to state that in the remote event of a completely severed CRT, the inoperable rod would be discovered by the weekly exercise surveillance. From the General Electric position stated above, it is clear that such reference to weekly exercising is a statement of current practice and not a

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recommendation.

With all the above considerations in support of extending the surveillance interval, in addition to the statistical analysis in our previous safety evaluation, and lacking any concrete information to the contrary, we continue to request action on our January 26, 1976 License Amendment Request. Our objective remains to update the surveillance program in support of a more optimum frequency which decreases fuel duty.

Based on discussions with your staff, certain supplementary remarks are also appropriate regarding the potential for a cracked CRT which is also discussed at length in our amendment request.

Our analyses for the proper surveillance frequency treats the failure of the control rod to insert as a random independent failure. The September 24, 1975 NRC staff safety evaluation on the cracked CRT issue states:

"Distribution of failures of similar specimens generally follow a log normal pattern, with one to two orders of magnitude in time or cycles between failures of the first and failures of the last specimen. As no collet housing has yet failed, we are confident that there would be very few, if any, failures during the next time period corresponding to the total service life to date."

Even though identical components may be subject to the same failure, we maintain that they should properly be treated as random failures if the time interval between failures is expected to substantially exceed the surveillance interval. We concur with the above staff position which clearly indicates that the expected time interval between failures grossly exceeds the proposed surveillance interval. The staff position concerning improved system reliability in light of common mode failure is summarized on Page 59 of WASH-1270 as follows: "It appears, therefore, that only limited improvement can be obtained by increasing the frequency of testing." From this we deduce that surveillance intervals are to be determined on the basis of random failures as we have done, and that common mode failures should be treated as another subject.

We believe that this additional information should allow the staff to resume their review of the January 26, 1976 License Amendment Request. If you require other clarifying information to process this request in a timely manner, please advise us. Should you be unable to issue authorization for this change, we shall appreciate receiving written notification with the technical basis for its unacceptability.

Yours very truly,



L O Mayer, PE  
Manager, Nuclear Support Services

LOM/MHV/deb

cc: J G Keppler  
G Charnoff  
MPCA  
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