

**NSP**

*Central Files*

**NORTHERN STATES POWER COMPANY**

MINNEAPOLIS, MINNESOTA 55401

July 30, 1979

Mr. James G. Keppler  
Director - Region III  
Office of Inspection and Enforcement  
United States Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

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

IE Bulletin 79-12 described several short period reactor scrams at other facilities and requested a response to several concerns within 60 days.

1. Monticello operating procedures have always required that an estimate of the critical rod pattern be made prior to each criticality. The critical rod pattern is estimated by combining the results of a three dimensional BWR core simulator, an infinite medium transient xenon simulator, and temperature defect data obtained by measurement at the beginning of each operating cycle. This combination allows us to take into account all of the important reactivity effects for each criticality.
2. All control rod withdrawal sequences used at Monticello are analyzed by NSP using a three-dimensional BWR simulator. This analysis is done for both cold, xenon free and hot, peak xenon conditions, and covers all withdrawals that can occur within  $\pm 1\%$   $\Delta K$  of any critical that is possible while the sequence is to be used. All group withdrawals found to be worth more than  $.25\%$   $\Delta K$  are analyzed further to find if any single rod withdrawal has greater than  $.25\%$   $\Delta K$  worth. If any are found, the analysis goes one step further to identify any notch worth more than  $.25\%$   $\Delta K$ . Any rod withdrawal found to be worth more than  $.25\%$   $\Delta K$  is separated into substeps on the roller tape that is used to define the withdrawal sequence for the reactor operators such that each substep is worth less than  $.25\%$   $\Delta K$ . If two sequential notches are worth more than  $.25\%$   $\Delta K$ , the withdrawal step is hi-lited. Any step containing a single notch worth more than  $.25\%$   $\Delta K$  is both hi-lited and circled. Each critical rod pattern estimate is accompanied by information showing a  $\pm 1\%$   $\Delta K$  band around the estimated critical

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pattern. Any control rod withdrawal step that is hi-lited must be single-notch withdrawn if it is within the  $\pm 1\%$   $\Delta K$  band. Any rod withdrawal step that is both hi-lited and circled is prohibited to be withdrawn until steam flow is established through the bypass valves. In addition, single-notch withdrawal is required for the withdrawal step on which criticality is predicted to occur or at any time that neutron response on the SRMs indicates that criticality may be imminent. Procedures direct the reactor operators to monitor all four SRMs for indications of reactor criticality during all control rod withdrawals.

3. Monticello control rod sequences are formed using the BPWS system. This system tends to minimize the worth of individual notch worths. The rod withdrawal sequence analysis, specially prepared rod sequence roller tape, critical rod pattern prediction and rod withdrawal procedures described above identify high worth notches or rod segments to the operators, provide appropriate rod sequences considering peak xenon conditions, and assure under all reactor conditions that no deliberate single reactivity insertion will result in an uncontrollable reactor period.
4. The "emergency rod in" switch at Monticello is a standard type of switch which has proven to be rugged and reliable during past operation. Since it has a rated mechanical life of 500,000 operations, it can be expected to continue to perform its function during future operation.
5. The Monticello Operator Retraining Program requires that each operator attend a minimum of 10 hours of scheduled seminars each year. A detailed review of the plant startup procedures is included in these seminars, including the points of concern expressed in Items 1-3. Unusual events and reportable occurrences from Monticello and other facilities are also discussed at the retraining seminars. These seminars adequately train Monticello operators to be aware of the identified areas of concern.

Please contact us if you require additional information concerning our response.

Yours very truly,



L. J. Wachter  
Vice President - Power Production  
and System Operation

cc: Mr. G. Charnoff  
Office of Inspection and Enforcement  
Washington, D.C.