MAR 2 1973

Docket No. 50-263

NSP notified
3-9-73

Northern States Power Company
ATTN: Mr. L. O. Mayer
Director of Nuclear Support Services
414 Nicollet Mall
Minneapolis, Minnesota 55401

Gentlemen:

Change No. 3
License No. DPR-22

Your letter dated February 2, 1973, proposed changes to the Technical Specifications of Provisional Operating License No. DPR-22 for the Monticello Nuclear Generating Plant. The proposed changes concern:

1. the option to bypass the rod block monitor upscale and downscale trips at power levels below 30%,

2. opening of control rod drive housing and instrument thimble for maintenance while the suppression chamber is drained,

3. reactor recirculation system crosstie valve interlocks, and

4. provisions for bypassing the refueling interlocks when the reactor mode switch is locked in the "Refuel" position.

We have reviewed the changes proposed by the Northern States Power Company (NSP) and on the basis of the information provided by NSP's letter dated February 2, 1973, and the supplemental information submitted by letter dated February 20, 1973, we have concluded that:

1. The rod block monitor downscale and upscale trip signals can be bypassed when the reactor is operating at less than 30% of rated power level because there is more than 40% margin to the power level above which the rod block monitor is required. This is sufficient margin to assure that the core design limit (MCHFR <1.0) is not exceeded.

2. The change to permit opening a control rod drive housing or instrument thimble (one at a time) while the suppression pool is drained is acceptable because ample core cooling can be provided from the irradiated fuel storage pool in the event of maximum leakage through the larger of the two openings in the bottom of the reactor vessel.

3. The change requiring reactor recirculation system crosstie valve interlocks to the main recirculation pumps including the provision to make the interlocks inoperable with both reactor recirculation pumps operating, if at least one of the two valves are closed is acceptable because closure of the crosstie valve limits the double-ended recirculation line break to an area of 4.2 ft^2. The peak clad temperature following such a break when operating at rated power is less than the 2300°F permitted by the AEC Interim Acceptance Criteria for Emergency Core Cooling Systems dated June 1971.

4. The refueling interlock input signal for a control rod that has been removed from the reactor vessel may be bypassed after the four fuel bundles next to that control rod have been removed because the reactor is less reactive with the strongest remaining control rod driven out of the core. The required shutdown margin is thereby preserved.

We have concluded that the proposed changes do not present significant hazards considerations not described or implicit in the Monticello Safety Analysis Report and that there is reasonable assurance that the health and safety of the public will not be endangered by operation of the reactor in the manner proposed.

Accordingly, the Technical Specifications are hereby changed to replace the existing pages 57, 58, 59, 67, 108, 113 and 187 with the enclosed revised pages bearing the same numbers and additional pages 108a, 188a and 189a. The revised pages also include corrections to previous minor typographical errors.

Sincerely,

Original Signed by:
Robert J. Schemel
/s/
Donald J. Skovholt, Assistant Director
for Operating Reactors
Directorate of Licensing

~~Enclosure and cc: See next page~~

Enclosures:
Revised pages 57, 58, 59, 67, 108, 108a, 113, 187, 188a and 189a.

cc w/enclosures:
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JJShea, L:OR #2
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DATE ▶	2/27/73	2/27/73	2/28/73	3/2/73		

Table 3.2.3
Instrumentation That Initiates Rod Block

Function	Trip Settings	Reactor Modes in Which Function Must be Operable or Operating and Allowable Bypass Conditions**			Total No. of Instrument Channels per Trip System	Min. No. of Operable or Operating Instrument Channels Per Trip System (Notes 1,6)	Required Conditions*
		Refuel	Startup	Run			
1. SRM							
a. Upscale	$\leq 5 \times 10^5$ cps	X	X(d)		2	1 (Note 3)	A or B or C
b. Detector not fully inserted		X(a)	X(a)		2	1(Note 3)	A or B or C
2. IRM							
a. Downscale	$\geq 3/125$ full scale	X(b)	X(b)		4	2(Note 4)	A or B or C
b. Upscale	$\leq 108/125$ full scale	X	X		4	2 (Note 4)	A or B or C
3. APRM							
a. Upscale (flow referenced)	$\leq .65W + 43$ (Note 2) See Fig. 2.3.1			X	3	1 (Note 7)	D or E
b. Downscale	$\geq 3/125$ full scale			X	3	1 (Note 7)	D or E

Table 3.2.3 - Continued
Instrumentation That Initiates Rod Block

Function	Trip Settings	Reactor Modes in Which Function Must Be Operable or Operating and Allowable Bypass Conditions**			Total No. of Instrument Channels per Trip System	Min. No. of Operable or Operating Instrument Channels Per Trip System (Notes 1,6)	Required Conditions*
		Refuel	Startup	Run			
[illegible]. RBM							
a. Upscale (flow referenced)	≤ .65 W + 43 (Note 2)			X (c)	1	1 (Note 5)	D or E
b. Downscale	≥ 2/125 full			X(c)	1	1 (Note 5)	D or E

Notes:

(1) There shall be two operable or operating trip systems for each function. If the minimum number of operable or operating instrument channels cannot be met for one of the two trip systems, this condition may exist up to seven days provided that during this time the operable system is functionally tested immediately and daily thereafter.

(2) "W" is the reactor recirculation driving flow in percent.

(3) Only one of the four SRM channels may be bypassed.

(4) There must be at least one operable or operating IRM channel monitoring each core quadrant.

(5) One of the two RBMs may be bypassed for maintenance and/or testing for periods not in excess of 24 hours in any 30 day period. An RBM channel will be considered inoperable if there are less than half the total number of normal inputs from any LPRM level.

Table 3.2.3 - Continued

Notes:

(6) Upon discovery that minimum requirements for the number of operable or operating trip systems or instrument channels are not satisfied actions shall be initiated to:

(a) Satisfy the requirements by placing appropriate channels or systems in the tripped condition, or

(b) Place the plant under the specified required conditions using normal operating procedures.

(7) There must be a total of at least 4 operable or operating APRM channels.

*Required conditions when minimum conditions for operation are not satisfied.

A. Reactor in Shutdown mode.

B. No rod withdrawals permitted while in Refuel or Startup mode.

C. Reactor in Run mode.

D. No rod withdrawals permitted while in the Run mode.

E. Power on IRM range or below and reactor in Startup, Refuel, or Shutdown mode.

**Allowable Bypass Conditions

a. SRM Detector-not-fully-inserted rod block may be bypassed when the SRM channel count rate is 100 cps or when all IRM range switches are above Position 2.

b. IRM Downscale rod block may be bypassed when the IRM range switch is in the lowest range position.

c. RBM Upscale and Downscale rod blocks may be passed below 30% rated power.

d. SRM Upscale block may be bypassed when associated IRM range switches are above Position 7.

Bases Continued:

3.2 The HPCI and/or RCIC high flow and temperature instrumentation is provided to detect a break in the HPCI and/or RCIC piping. Tripping of this instrumentation results in actuation of HPCI and/or RCIC isolation valves; i.e., Group 4 and/or Group 5 valves. The trip settings of 200°F and 150% of design flow and valve closure time are such that core uncovery is prevented and fission product release is within 10 CFR 100 guidelines.

The instrumentation which initiates ECCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion the Specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed.

The control rod block functions are provided to prevent excessive control rod withdrawal so that MCHFR does not decrease to 1.0. The trip logic for this function is 1 out of n; e.g., any trip on one of the six APRM's, eight IRM's, or four SRM's will result in a rod block. The minimum instrument channel requirements for the IRM and RBM may be reduced by one for a short period of time to allow for maintenance, testing, or calibration. See Section 7.3 FSAR.

The APRM rod block trip is referenced to flow and prevents a signigicant reduction in MCHFR especially during operation at reduced flow. The APRM provides gross core protection; i.e., limits the gross core power increase from withdrawal of control rods in the normal withdrawal sequence. The trips are set so that MCHFR is maintained greater than 1.0.

~~THE~~ RBM provides local protection of the core; i.e., the prevention of critical heat flux in a local region of the core, for a single rod withdrawal error from a limiting control rod pattern. The trip point is referenced to flow. The worst case single control rod withdrawal error has been analyzed and the results show that with the specified trip settings rod withdrawal is blocked when MCHFR is ≥1.3, thus allowing adequate margin. Ref. Section 7.4.5.3 and 14.5.3 FSAR. Below 70% power the worst case withdrawal of a single control rod results in a MCHFR >1.0 without rod block action, thus below this level it is not required. This subject is discussed in the General Electric licensing Topical Report NEDO-10189 (70 NED 16) July 1970, An Analysis of Functional Common Mode Failures in GE BWR Protection and Instrumentation. Requiring at least half of the normal LPRM inputs from each level to be operable assures that the RBM response will be adequate to prevent rod withdrawal errors.

The IRM rod block function provides local as well as gross core protection. The scaling arrangement is such that trip setting is less than a factor of 10 above the indicated level. Analysis of the worst case accident results in rod block action before MCHFR approaches 1.0. Ref. Section 7.4.4.3 FSAR.

A downscale indication of an APRM or IRM is an indication the instrument has failed or the instrument is not sensitive enough. In either case the instrument will not respond to changes in control rod motion and thus control rod motion is prevented. The downscale trips are set at 3/125 of full scale.

3.0 LIMITING CONDITIONS FOR OPERATION	4.0 SURVEILLANCE REQUIREMENTS
3. When irradiated fuel is in the reactor vessel and reactor coolant temperature is less than 212°F, all low pressure core and containment cooling subsystems may be inoperable provided no work is being done which has the potential for draining the reactor vessel except as allowed by specification 3.5.G.4 below. 4. When irradiated fuel is in the reactor vessel and the vessel head is removed, the suppression chamber may be drained completely and no more than one control rod drive housing or instrument thimble opened at any one time provide that the spent fuel pool gates are open and the fuel pool water level is maintained at a level of greater than or equal to 33 feet. H. Extended Maintenance When it is determined that maintenance to restore components or systems to an operable condition will last longer than the periods specified, a report detailing the circumstances and the estimated date for returning the components or systems to an operable condition shall be submitted to the AEC prior to the allowable end of the out-of-service period.	

3.0 LIMITING CONDITIONS FOR OPERATION

I. Recirculation System

1. Except as specified in 3.5.I.2 below, whenever irradiated fuel is in the reactor, with reactor coolant temperature greater than 212°F and both reactor recirculation pumps operating, the recirculation system cross tie valve interlocks shall be operable.

2. The recirculation system cross tie valve interlocks may be inoperable if at least one cross tie valve is maintained fully closed.

4.0 SURVEILLANCE REQUIREMENTS

I. Recirculation System

1. Once per month, when irradiated fuel is in the reactor with reactor coolant temperature greater than 212°F and both reactor recirculation pumps operating, the recirculation system cross tie valve interlocks shall be demonstrated to be operable by verifying that the cross tie valves cannot be opened using the normal control switch.

2. When a recirculation system cross tie valve interlock is inoperable, the position of at least one fully closed cross tie valve shall be recorded daily.

Bases Continued 3.5:

G. Emergency Cooling Availability

The purpose of Specification G is to assure that sufficient core cooling equipment is available at all times. It is during refueling outages that major maintenance is performed and during such time that all core and containment cooling subsystems may be out of service. Specification 3.5.G.3 allows all core and containment cooling subsystems to be inoperable provided no work is being done which has the potential for draining the reactor vessel. Thus events requiring core cooling are precluded.

Specification 3.5.G.4 recognizes that concurrent with control rod drive maintenance during the refueling outage, it may be necessary to drain the suppression chamber for maintenance or for the inspection required by Specification 4.7.A.1. In this situation, a sufficient inventory of water is maintained to assure adequate core cooling in the unlikely event of loss of control rod drive housing or instrument thimble seal integrity.

H. Extended Maintenance

Nearly all maintenance can be completed within a few days. Infrequently, however, major maintenance might be required. Replacement of principal system components could necessitate outages of more than the time allowed for a system or component to be out of service. In spite of the best efforts of the operator to return equipment to service, some maintenance could require up to six months.

I. Recirculation System

The capacity of the Emergency Core Coolant System is based on the potential consequences of a double ended recirculation line break. The peak fuel clad temperature is a function of the size of line break presented in a document entitled, "Monticello Nuclear Generating Plant ECCS Conformance to New AEC Adopted Interim Acceptance Criteria" submitted September 21, 1971. A double ended recirculation line break involves 4.2 sq. ft. when the cross tie valves are closed and 5.6 sq. ft. when the cross tie valves are open. The referenced report shows that the peak fuel clad temperature for the 4.2 sq. ft. rupture while operating at rated power is sufficiently less than the 2300°F limit set forth in the "AEC Adopted Interim Acceptance Criteria for Performance of ECCS for Light Water Power Reactors" dated June 19, 1971. However, a break of 5.6 sq. ft will result in clad temperatures in excess of 2300°F. Therefore, at least one cross tie valve must remain closed to reduce the potential break area.

The cross tie valve is allowed to be open during one pump operation. With only one pump, rated power cannot be achieved. Under these conditions, the expected peak clad temperature during a loss of coolant accident is less than that for two pump operation with the cross tie valve closed.

3.10 REFUELING

Applicability:

Applies to fuel handling and core reactivity limitations.

Objective:

To assure core reactivity is within capability of the control rods and to prevent criticality during refueling.

Specification:

A. Refueling Interlocks

The reactor mode switch shall be locked in the "Refuel" position during core alterations and the refueling interlocks shall be operable except as specified in specification 3.10.E.

4.10 REFUELING

Applicability:

Applies to the periodic testing of those interlocks and instruments used during refueling.

Objective:

To verify the operability of instrumentation and interlocks used in refueling.

Specification:

A. Refueling Interlocks

Prior to any fuel handling, with the head off the reactor vessel, the refueling interlocks shall be functionally tested. They shall also be tested at weekly intervals thereafter until no longer required and following any repair work associated with the interlocks.

3.0 LIMITING CONDITIONS FOR OPERATION	4.0 SURVEILLANCE REQUIREMENTS
E. Extended Core and Control Rod Drive Maintenance Control rods may be withdrawn from the reactor core provided the following conditions are satisfied: 1. The reactor mode switch shall be locked in the "Refuel" position. The refueling interlock input signal from a withdrawn control rod may be bypassed on a withdrawn control rod when the fuel assemblies in the cell containing (controlled by) that control rod are removed from the reactor core. All other refueling interlocks shall be operable. 2. SRM's shall be operable in the core quadrant where fuel or control rods are being moved, and in an adjacent quadrant. The requirements for an SRM to be considered operable are given in 3.10.B.	

Bases Continued:

E. The intent of this specification is to permit the unloading of a significant portion of the reactor core for such purposes as removal of temporary control curtains, control rod drive maintenance, in-service inspection requirements, examination of the core support plate, etc. When the refueling interlock input signal from a withdrawn control rod is bypassed, administrative controls will be in effect to prohibit fuel from being loaded into that control cell.

These operations are performed with the mode switch in the "Refuel" position to provide the refueling interlocks normally available during refueling as explained in Part A of these Bases. In order to withdraw more than one control rod, it is necessary to bypass the refueling interlock on each withdrawn control rod. The requirement that the fuel assemblies in the cell controlled by the control rod be removed from the reactor core before the interlock can be bypassed insures that withdrawal of another control rod does not result in inadvertent criticality. Each control rod essentially provides reactivity control for the fuel assemblies in the cell associated with the control rod. Thus, removal of an entire cell (fuel assemblies plus control rod) results in a lower reactivity potential of the core.