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LICENSE NO DPR-22 APPL FOR AMEND: TECH SPECS CHANGE CONCERNING REVISION TO THE FIELD BREAKER RECIRCULATION PUMP TIRP SYSTEM.

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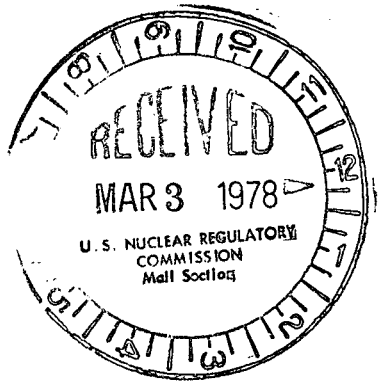


March 1, 1978

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

License Amendment Request Dated March 1, 1978

Attached are three originals and 37 conformed copies of a request for a change to the Provisional Operating License, Appendix A Technical Specifications, for the Monticello Nuclear Generating Plant. This change concerns the field breaker recirculation pump trip system.

In previous communications we committed to implement a recirculation pump trip at Monticello. In a September 20, 1977 status report, we agreed to propose Technical Specification changes 90 days prior to implementation as you requested. Our schedule for implementation remains the same as stated in the September letter. In summary, the earliest possible time for implementation, based on equipment delivery, is next June; the most likely time for implementation is during the fall refueling outage. We request that you issue these specifications such that they become effective at the time the MG-set field breaker pump trip is declared operable. We will inform you if implementation is expected to occur at any time other than the fall 1978 refueling outage.

L. O. Mayer

L O Mayer, PE
Manager of Nuclear Support Services

LOM/MHV/deh

cc: J G Keppler
G Charnoff
MPCA
Attn: J W Ferman

Attachments

A001
S
3/40

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT

Docket No. 50-263

REQUEST FOR AMENDMENT TO
OPERATING LICENSE NO. DPR- 22

(License Amendment Request Dated March 1, 1978)

Northern States Power Company, a Minnesota corporation, requests authorization for changes to the Technical Specifications as shown on the attachments labeled Exhibit A and Exhibit B. Exhibit A describes the proposed changes along with reasons for the change. Exhibit B is a set of Technical Specification pages incorporating the proposed changes.

This request contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By L. J. Wachter
L J Wachter
Vice President, Power Production &
System Operation

On this 1st day of March, 1978, before me a notary public in and for said County, personally appeared L J Wachter, Vice President, Power Production & System Operation, and first being duly sworn acknowledged that he is authorized to execute this document in behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

Denise E. Halvorson

DENISE E. HALVORSON
NOTARY PUBLIC - MINNESOTA
HENNEPIN COUNTY
My Commission Expires Oct. 10, 1981

EXHIBIT A

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

LICENSE AMENDMENT REQUEST
DATED MARCH 1, 1978

PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS

Pursuant to 10CFR50.59, the holders of Provisional Operating License DPR-22 hereby propose the following change to the Appendix A Technical Specifications.

PROPOSED CHANGES

Page ii-Add a new item in the Table of Contents for Sections 3.2 and 4.2 entitled, "F. Recirculation Pump Trip System 49".

Page ix-Change Table number 3.2.5 to 3.2.6. Insert a new entry, "3.2.5 Instrumentation That Initiates A Recirculation Pump Trip 60A".

Page 49-Add a new LCO as follows,

"F. Recirculation Pump Trip Initiation

1. Whenever the reactor is in the Run mode, the limiting conditions for operation for the instrumentation listed in Table 3.2.5 shall be met."

Page 60A-Insert a new page as shown in Exhibit B. This page includes Table 3.2.5 and notes pertaining to the table.

Page 62-Add to Table 4.2.1 the surveillance requirements for the Recirculation Pump Trip circuitry as shown in Exhibit B.

Pages 68 and 68A-Insert the paragraph shown in Exhibit B which states the bases for the recirculation pump trip system and the limiting conditions for operation. In the following paragraph, add Table 3.2.5 to the listing of applicable tables. A new page, 68A, is required to effect this change.

Page 69-Change the number of the table entitled, "Trip Functions and Deviations" from 3.2.5 to 3.2.6.

Page 70-Add a section to the table to include Instrumentation that Initiates a Recirculation Pump Trip as shown in Exhibit B.

REASON FOR CHANGES

Numerous studies have been performed to assess the probability and consequences of the failure to scram immediately following an abnormal operational transient. On September 15, 1976, the licensee committed to install a recirculation pump trip system to implement a means of substantially reducing maximum reactor vessel pressure in the unlikely event of a failure to scram. The proposed technical specifications for the new trip system are modeled after the specifications for existing protective instrumentation.

SAFETY EVALUATION

The safety evaluation for the recirculation pump trip system has been discussed in two previous documents; only those facets unique to the technical specification requirements will be considered in depth here. The first reference document is a topical report entitled, "Evaluation of Anticipated Transients Without Scram for the Monticello Nuclear Generating Plant, NEDO-25016, September 1976". This document was submitted by Mr L O Mayer (NSP) to Mr D L Ziemann (USNRC) on September 15, 1976. Errata pages were sent between the same parties on November 16, 1976. The second reference document is the NRC Staff safety evaluation of the recirculation pump trip system transmitted by Mr K R Goller to Mr L O Mayer on February 23, 1977.

The proposed limiting condition for operation requires the recirculation pump trip system to be operable when the reactor is in the run mode. Since the capacity of the safety/relief valves is far in excess of the steam generation rate achievable in any other mode, there is no potential for vessel overpressurization in modes other than run. Restricting the LCO to the run mode is therefore appropriate.

The proposed operability requirements are similar to those of like systems. These requirements were assumed in the design and reliability analysis of the trip system.

The proposed surveillance requirements incorporate the fact that analog transmitters are used in recirculation pump trip system. As noted in reference documents, these devices are a new, improved line of BWR instrumentation. The calibration frequency is therefore proposed to be once per operating cycle which is consistent with both the equipment capabilities and the requirements for similar equipment used by other reactor vendors. The calibration frequency of the trip units is proposed to be quarterly, the same as other similar protective instrumentation. Likewise, the test frequency is specified at monthly like that of other protective instrumentation. A sensor check is proposed once per day; this is considered to be an appropriate frequency, commensurate with the design applications and the fact that the recirculation pump trip system is a backup to existing protective instrumentation.

The Technical Specifications acknowledge that devices will inherently deviate slightly from their settings over a period of time. This is the basis for specifying both the periodic calibration requirement and the allowable deviation; that is, the amount by which a setting can be found to have deviated from the

specified setpoint without it being considered a violation, provided the device is not knowingly set outside the specified range. The allowable deviation is a small margin (generally well below the margin that could be justified) which, based on engineering judgement, is a small fraction of the conservatism in the analysis. The deviation of the high reactor pressure setpoint is specified as one percent of the setpoint or 12 psi. The deviation for low reactor water level is specified as three inches, the same as the other low level protective instrumentation. A review of the progression of the transients in which these trip signals are required shows that the specified values are appropriate.

With the implementation of the above proposed technical specification changes, there is adequate assurance that the recirculation pump trip system will perform in the manner analyzed to provide the intended plant protection in the extremely remote probability of a plant transient with a failure to scram.

EXHIBIT B

LICENSE AMENDMENT REQUEST
DATED MARCH 1, 1978

This exhibit consists of the following pages revised to incorporate all of the proposed Technical Specification changes:

ii
ix
49
60A (new page)
62
68
68A (new page)
69
70

## LIST OF TABLES

| 3.0 LIMITING CONDITIONS FOR OPERATION | 4.0 SURVEILLANCE REQUIREMENTS |
|---|---|

E. Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation

1. a. Except as specified in 3.2.E.1.b below, four radiation monitors shall be operable at all times.

   b. One of the two monitors in the ventilation plenum and one of the two radiation monitors on the refueling floor may be inoperable for 24 hours. If the inoperable monitors are not restored to service in this time, the reactor building ventilation system shall be isolated and the standby gas treatment system operated until repairs are complete.

2. The radiation monitors shall be set to trip as follows:

   (a) ventilation plenum $\leq$ 3 mr/hr
   (b) refueling floor $\leq$100 mr/hr

3. When irradiated fuel is in the reactor vessel and the reactor water temperature is above 212°F, the limiting conditions for operation for the instrumentation listed in Table 3.2.4 shall be met.

F. Recirculation Pump Trip Initiation

1. Whenever the reactor is in the RUN Mode, the limiting conditions for operation for the instrumentation listed in Table 3.2.5 shall be met.

Table 3.2.5

Instrumentation that Initiates a Recirculation Pump Trip

| Function | Trip Setting | Minimum No. of Operable or Operating Trip Systems (1) | Total No. of Instrument Channels Per Trip System | Minimum No. of Operable or Operating Instrument Channels Per Trip System (1) | Required Conditions* |
|---|---|---|---|---|---|
| 1. High Reactor Dome Pressure | $\leq$ 1150 psig | 2 | 2 | 2 | A |
| 2. Low Reactor Water Level | $\geq$6' 6" above the top of the active fuel. | 2 | 2 | 2 | A |

NOTE:

1. Upon discovery that minimum requirements for the number of operable or operating trip systems or instrument channels are not satisfied, action shall be initiated to:

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

   b. Place the plant under the specified required condition using normal operating procedures.

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

   A. Reactor in Startup, Refuel or Shutdown mode.

Table 4.2.1 - Continued

Minimum Test and Calibration Frequency For Core Cooling, Rod Block and Isolation Instrumentation

| Instrument Channel | Test (3) | Calibration (3) | Sensor Check (3) |
|---|---|---|---|
| 3. Steam Line Low Pressure | Note 1 | Once/3 months | None |
| 4. Steam Line High Radiation | Once/week (5) | Note 6 | Once/shift |
| HPCI ISOLATION | | | |
| 1. Steam Line High Flow | Note 1 | Once/3 months | None |
| 2. Steam Line High Temperature | Note 1 | Once/3 months | None |
| RCIC ISOLATION | | | |
| 1. Steam Line High Flow | Note 1 | Once/3 months | None |
| 2. Steam Line High Temperature | Note 1 | Once/3 months | None |
| REACTOR BUILDING VENTILATION | | | |
| 1. Radiation Monitors (Plenum) | Note 1 | Once/3 months | Once/shift |
| 2. Radiation Monitors (Refueling Floor) | Note 1 | Once/3 months | (4) |
| OFF-GAS ISOLATION | | | |
| 1. Radiation Monitors (Air Ejectors) | Notes (1,5) | Note 6 | Once/shift |
| RECIRCULATION PUMP TRIP | | | |
| 1. Reactor High Pressure | Note 1 | Once/Operating Cycle - Transmitter<br>Once/3 Months - Trip Unit | Once/Day |
| 2. Reactor Low Water Level | Note 1 | Once/Operating Cycle - Transmitter<br>Once/3 Months - Trip Unit | Once/Day |

NOTES:

(1) Initially once per month until exposure hours (M as defined on Figures 4.1.1) is $2.0 \times 10^5$, thereafter according to Figure 4.1.1 with an interval not greater than three months.

Bases Continued:

3.2 For effective emergency core cooling for the small pipe break the HPCI or Automatic Pressure Relief system must function since for these breaks, reactor pressure does not decrease rapidly enough to allow either core spray or LPCI to operate in time. The arrangement of the tripping contacts is such as to provide this function when necessary and minimize spurious operation. The trip settings given in the specification are adequate to assure the above criteria is met. Reference Section 6.2.4 and 6.2.6 FSAR. The specification preserves the effectiveness of the system during periods of maintenance, testing, or calibration, and also minimizes the risk of inadvertent operation; i.e., only one instrument channel out of service.

Two air ejector off-gas monitors are provided and when their trip point is reached, cause an isolation of the air ejector off-gas line. Isolation is initiated when both instruments reach their high trip point or one has an upscale trip and the other a downscale trip or two downscale. There is a 30-minute delay before recombiner train inlet valve closure when the recombiners are in use and a 15-minute delay before off-gas isolation valve closure when the recombiners are bypassed in which the reactor operator may take corrective action. Both instruments are required for trip. The trip settings of the instruments are set so that the maximum stack release rate limit is not exceeded.

Four radiation monitors are provided which initiate isolation of the reactor building and operation of the standby gas treatment system. The monitors are located in the reactor building ventilation plenum and on the refueling floor. Any one upscale trip will cause the desired action. Trip settings of 3 mR/hr for the monitors in the ventilation duct are based upon initiating normal ventilation isolation and Standby Gas Treatment System operation so as not to exceed the maximum release rate limit for the reactor building vent. Trip settings of 100 mR/hr for the monitors on the refueling floor are based upon initiating normal ventilation isolation and standby gas treatment system operation so that none of the activity released during the refueling accident leaves the reactor building via the normal ventilation stack but that all the activity is processed by the standby gas treatment system.

The recirculation pump trip description and performance analysis is discussed in Topical Report NEDO-25016, September 1976, "Evaluation of Anticipated Transients Without Scram for the Monticello Nuclear Generating Plant". (See September 15, 1976 letter from Mr L O Mayer, NSP, to Mr D L Ziemann, USNRC.) The pump trip is provided to minimize reactor pressure in the highly unlikely event of a plant transient coincident with the failure of all control rods to scram. The rapid flow reduction

Bases Continued:

increases core voiding, a negative reactivity feedback. High pressure sensors initiate the pump trip in the event of an isolation transient. Low level sensors initiate the trip on loss of feedwater (and the resulting MSIV closure). The recirculation pump trip is only required at high reactor power levels, where the safety/relief valves have insufficient capacity to relieve the steam which continues to be generated after reactor isolation in this unlikely postulated event, requiring the trip to be operable only when in the RUN mode is therefore conservative.

Although the operator will set the set points within the trip settings specified in Tables 3.2.1, 3.2.2, 3.2.3, 3.2.4, and 3.2.5, the actual values of the various set points can differ appreciably from the value the operator is attempting to set. The deviations could be caused by inherent instrument error, operator setting error, drift of the set point, etc. Therefore, these deviations have been accounted for in the various transient analyses and the actual trip settings may vary by the following amounts.

Table 3.2.6
Trip Functions And Deviations

| | Trip Function | Deviation |
|---|---|---|
| Reactor Building Ventilation Isolation and Standby Gas Treatment System Initiation Specification 3.2.E.3 and Table 3.2.4 | Ventilation Plenum Radiation Monitors | +0.2 Mr/Hr |
| | Refueling Floor Radiation Monitors | +5 Mr/Hr |
| | Low Reactor Water Level | -6 inches |
| | High Drywell Pressure | + 1 psi |
| Primary Containment Isolation Functions Table 3.2.1 | Low Low Water Level | -3 inches |
| | High Flow in Main Steam Line | +2 % |
| | High Temp. in Main Steam Line Tunnel | +2°F |
| | Low Pressure in Main Steam Line | -10 psi |
| | High Drywell Pressure | +1 psi |
| | Low Reactor Water Level | -6 inches |
| | HPCI High Steam Flow | +7,500 lb/hr |
| | HPCI Steam Line Area High Temp. | +2°F |
| | RCIC High Steam Flow | +2250 lb/hr |
| | RCIC Steam Line Area High Temp | +2°F |

Table 3.2.6 - Continued
Trip Function and Deviations

| | Trip Function | Deviation |
|---|---|---|
| Instrumentation That Initiates Emergency Core Cooling Systems Table 3.2.2 | Low-Low Reactor Water Level | -3 Inches |
| | Reactor Low Pressure (Pump Start) Permissive | -10 psi |
| | High Drywell Pressure | +1 psi |
| | Low Reactor Pressure (Valve Permissive | -10 psi |
| Instrumentation That Initiates Rod Block Table 3.2.3 | IRM Downscale | -2/125 of Scale |
| | IRM Upscale | +2/125 of Scale |
| | APRM Downscale | -2/125 of Scale |
| | APRM Upscale | See Basis 2.3 - Page 24 |
| | RBM Downscale | -2/125 of Scale |
| | RBM Upscale | Same as APRM Upscale |
| Instrumentation That Initiates Recirculation Pump Trip | High Reactor Pressure | + 12 psi |
| | Low Reactor Water Level | - 3 Inches |

A violation of this specification is assumed to occur only when a device is knowingly set outside of the limiting trip settings, or, when a sufficient number of devices have been affected by any means such that the automatic function is incapable of operating within the allowable deviation while in a reactor mode in which the specified function must be operable or when actions specified are not initiated as specified.