



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 121 AND 114 TO

FACILITY OPERATING LICENSE NOS. DPR-42 AND DPR-60

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NOS. 1 AND 2

DOCKET NOS. 50-282 AND 50-306

1.0 INTRODUCTION

By letter dated January 10, 1995, as supplemented August 9 and September 20, 1995, the Northern States Power Company (NSP or the licensee) requested amendments to the Technical Specifications (TS) appended to Facility Operating License Nos. DPR-42 and DPR-60 for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2. The proposed amendments would incorporate Limiting Condition for Operation (LCO) requirements from NUREG-1431, "Standard Technical Specifications (STS) for Westinghouse Plants," dated September 1992, into the plant TS Section 3.15, Event Monitoring Instrumentation. The proposed amendments would also make necessary changes in TS Table 4.1-1C, Miscellaneous Instrumentation Surveillance Requirements, and Bases 3.15, Event Monitoring Instrumentation, to reflect TS Section 3.15 changes.

Incorporation of STS LCO Section 3.3.3 into the plant TS Section 3.15 would:

- a. Revise the table of contents to reflect the merging of TS Section 3.15-1 subsections A, B, and C into one section, TS Section 3.15, and the merging of TS Tables 3.15-1, 3.15-2, and 3.15-3 into one table, TS Table 3.15-1.
- b. Revise the action statements in TS Section 3.15 associated with inoperability of instrumentation for post-accident monitoring (PAM) parameters.
- c. Replace the columns titled "Required Total No. of Channels" and "Minimum Channels Operable" with a column titled "Required Channels" in TS Table 3.15-1.
- d. Delete non-Category 1 instrumentation from TS Table 3.15-1.
- e. Revise surveillance requirements for containment area radiation and reactor vessel level instruments in TS Table 4.1-1C.
- f. Revise Bases 3.15 to correspond with the changes in TS Section 3.15.

## 2.0 EVALUATION

The purpose of the PAM instrumentation is to display variables that provide information required by the control room operators during and following an accident. This information provides the necessary support for the operators to take the manual actions required for safety systems to accomplish their safety functions for design-basis accidents. The operability of the PAM instrumentation ensures that sufficient information is available on selected parameters for the operator to monitor and to assess the plant status and behavior following an accident. The following evaluation addresses the operability requirements, and the associated required actions.

### 2.1 Required Channels and Diverse Variables

The licensee proposed a revision to TS Table 3.15-1 to the format presented in STS Table 3.3.3-1 by replacing columns titled "Required Total No. of Channels" and "Minimum Channels Operable" with a column titled "Required Channels." Table 3.3.3-1 of the STS requires two operable channels for PAM functions. Two operable channels ensure that no single failure prevents the operator from getting information necessary for determining the safety status of the plant and bringing the plant to a safe condition following an accident.

Consistent with STS Table 3.3.3-1, the licensee has proposed that two channels for each parameter be provided as specified in TS Table 3.15-1, except reactor coolant system (RCS) hot leg temperature and RCS cold leg temperature. For RCS hot leg temperature and RCS cold leg temperature the licensee has proposed one channel per loop (Prairie Island, Units 1 and 2, are two-loop plants) of instrumentation for operability along with indication of diverse variables.

The licensee has proposed that core exit temperature, RCS cold leg temperature, and steam generator pressure serve as diverse variables for RCS hot leg temperature. Since core exit temperature correlates with RCS hot leg temperature, the use of core exit temperature, RCS cold leg temperature, and steam generator pressure provide appropriate alternative indications for RCS hot leg temperature and are, therefore, acceptable.

The licensee has proposed that core exit temperature, steam generator pressure, and RCS hot leg temperature serve as diverse variables for RCS cold leg temperature. Because heat is transferred from the RCS to the steam generators, steam generator temperature (which can be derived from steam generator pressure) will be lower than RCS cold leg temperature. The difference between steam generator temperature and RCS cold leg temperature is proportional to the heat removed. RCS cold leg temperature is used in calculations to determine the RCS cooldown rate. The use of steam generator temperature in place of RCS cold leg temperature would reflect a higher cooldown rate than the actual cooldown rate and thus result in a more conservative operation. The licensee has also committed to establishing standing procedural guidance for the plant operators directing them to use steam generator pressure in lieu of RCS cold leg temperature in the event of

RCS cold leg temperature unavailability. Since the use of steam generator temperature in place of RCS cold leg temperature would be conservative, the use of steam generator pressure, core exit temperature, and RCS hot leg temperature provide appropriate alternative indications for RCS cold leg temperature and are, therefore, acceptable.

## 2.2 Action Statements

The licensee also proposed changes to the action statements associated with each PAM variable. The staff reviewed similarities between the proposed action statements and those of the STS and found the following deviations.

### 2.2.1 Orderly Transition

The proposed Action Statement 2 states that with two required channels inoperable, restore one channel to operable status within 7 days, or be in at least Mode 3 within the next 6 hours. In the STS, the required action for this condition is to be in Mode 3 within 6 hours and be in Mode 4 within 12 hours. The action statement in the existing TS Table 3.15-1, which the proposed Action Statement 2 replaces, does not have a requirement to proceed to Mode 4. The proposed action statement does not change the present commitment nor appear to adversely affect continued safe operation of the plant. Therefore, the proposed change is acceptable.

### 2.2.2 Diverse Channels

The proposed action statements for RCS hot leg temperature and RCS cold leg temperature deviate from the STS which requires two channels per loop. The proposed action statement provides for one channel per loop and a diverse indication in place of a second channel.

The proposed action statements for these variables state that with the required channel inoperable, and at least one diverse channel operable for the affected loop, restore the required channel to operable status within 30 days. If the required channel is not restored to operable status within 30 days, prepare and submit a special report to the Commission within 14 days outlining the actions taken (including the preplanned alternate method of monitoring), the cause of the inoperability, and the plans and schedule for restoring the inoperable channel to operable status.

The above action statements are similar to the action statements for two-channel systems where one channel is inoperable and the STS require the inoperable channel be restored to operable status within 30 days or a special report be submitted to the NRC within the next 14 days providing plans for restoring the inoperable channel to operable status. The licensee takes credit in the proposed TS for the diverse channel in place of the second channel and follows the action statement for one inoperable channel. Although the operable diverse channel is not an exact measurement of the primary

variable, the operator is still able to derive the necessary information about the primary variable.

Therefore, the action statements for these variables with the appropriate diverse channel as the second channel is consistent with the STS and is acceptable.

In the event that both the required channel and the diverse channel for the affected loop are inoperable, the TS would require either the required channel or the diverse channel be restored within 7 days or the plant be shut down, which is commensurate with the required action in the STS for a total loss of indication, and is, therefore, acceptable.

### 2.3 Deletion of Non-Category 1 Instrumentation

Auxiliary feedwater flow, RCS subcooling margin, pressure-operated relief valve position, pressure-operated relief block valve position, pressurizer safety valve position, containment water level (narrow range), steam relief activity monitor, and high-range shield building vent releases are Regulatory Guide (R.G.) 1.97 ("Instrumentation for Light-Water Cooled Nuclear Power Plants To Assess Plant and Environs Conditions During and Following an Accident") Category 2 variables and are not included in the STS for PAM. Therefore, the licensee has proposed that these instruments be deleted from TS Table 3.15-1. The deletion of these instruments from TS Table 3.15-1 is acceptable.

### 2.4 Surveillance Requirements

The licensee has proposed a revision to TS Table 4.1-1C regarding surveillance requirements for containment radiation and reactor vessel water level. The licensee proposes that surveillance for these two instruments be the same as the surveillance requirements for other PAM instrumentation. The proposed surveillance requirements for containment radiation and reactor vessel water level are consistent with the STS, and are, therefore, acceptable.

### 2.5 Bases 3.15

The licensee proposed that Bases 3.15 be revised to define the contents of required reports, provide clarifications on containment penetration flow path status, and include core exit thermocouple changes commensurate with the changes in TS 3.15. The proposed changes to Bases 3.15 are consistent with the STS, and are, therefore, acceptable.

### 2.6 Summary

Based on our review of the proposed amendments, the staff concludes that the proposed changes to the PAM instrumentation operability requirements for the Prairie Island Nuclear Generating Plant, Units 1 and 2, TS conform to the STS and their bases and the guidelines of R.G. 1.97. The staff further determined that the proposed TS changes provide appropriate limiting conditions for operation and action statements for the PAM instrumentation, and are, therefore, acceptable.



### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Minnesota State official was notified of the proposed issuance of the amendments. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration and there has been no public comment on such finding (60 FR 8753). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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