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June 3, 2024

L-PI-24-014
10 CFR 50.90

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant, Units 1 and 2
Docket Nos. 50-282 and 50-306
Renewed Facility Operating License Nos. DPR-42 and DPR-60

License Amendment Request to Revise the Technical Specification Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and Apply Response Time Testing to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

Pursuant to 10 CFR 50.90, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby requests an amendment to the Technical Specifications (TS) for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, Renewed Facility Operating License Nos. DPR-42 and DPR-60. The proposed change would revise the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME used in TS Surveillance Requirement (SR) 3.3.1.16 to allow allocation of response times in lieu of testing using the proposed methodology included here as Enclosure 2.

NSPM also proposes to revise TS Table 3.3.1-1 to apply SR 3.3.1.16 to the RTS trip functions for which the accident analyses include assumptions about time delays.

Enclosure 1 provides NSPM's evaluation of the proposed TS change. Attachment 1 to Enclosure 1 provides the marked-up PINGP TS pages. Attachment 2 to Enclosure 1 provides re-typed copies of the PINGP TS pages. Attachment 3 to Enclosure 1 provides the marked-up PINGP TS Bases pages, which are being provided for information only. Enclosure 2 is a proposed methodology for allocating response times to the PINGP components that are subject to response time testing.

NSPM has evaluated the changes proposed in this License Amendment Request in accordance with 10 CFR 50.92 and concluded that they involve no significant hazards consideration. In accordance with 10 CFR 50.91(b)(1), a copy of this application, with Enclosure 1, is being provided to the designated Minnesota official.

NSPM requests approval of the proposed amendment and methodology within 12 months of acceptance, with an implementation period of 90 days.

If there are any questions or if additional information is required, please contact Mr. Jeff Kivi at (612) 330-5788 or Jeffrey.L.Kivi@xcelenergy.com.

Summary of Commitments

This letter makes no new commitments and retires existing commitments (made in a May 31, 1989, letter from NSPM to the NRC) to conduct response time testing of the low pressurizer pressure and low reactor coolant flow RTS trip functions. The commitments will no longer be needed because the proposed changes add TS SR 3.3.1.16 response time testing to these two RTS trip functions in a revision to TS Table 3.3.1-1.

I declare under penalty of perjury, that the foregoing is true and correct.
Executed on June 3, 2024

Thomas A. Conboy
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosures

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota (Enclosure 1 only)

ENCLOSURE 1

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

Evaluation of the Proposed Change

License Amendment Request to Revise the Technical Specification Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and Apply Response Time Testing to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

ATTACHMENTS:

1. Technical Specification Pages (Markup)
2. Technical Specification Pages (Retyped)
3. Technical Specification Bases Pages (Markup – for information only)

License Amendment Request to Revise Technical Specification Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and Apply Response Time Testing to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby requests an amendment to the Technical Specifications (TS) for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, Renewed Facility Operating License Nos. DPR-42 and DPR-60. The proposed change would revise the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME used in TS Surveillance Requirement (SR) 3.3.1.16 to allow allocation of response times in lieu of testing using the proposed methodology included here as Enclosure 2.

NSPM also proposes to revise TS Table 3.3.1-1 to apply SR 3.3.1.16 to the RTS trip functions for which the accident analyses include assumptions about time delays.

2.0 DETAILED DESCRIPTION

2.1 System Design and Operation

The RTS initiates a unit shutdown, based on the values of selected unit parameters, to protect against violating the core fuel design limits and Reactor Coolant System (RCS) pressure boundary during anticipated operational occurrences and to assist the Engineered Safety Features Systems in mitigating accidents. The sub-systems of the RTS are the Nuclear Instrumentation System (NIS), the Relay Protection System (RPS), and the Process Protection System (PPS).

As noted in the Bases for TS SR 3.3.1.16, Response Time Testing (RTT) verifies that the individual channel or train actuation response times are less than or equal to the maximum time delay values assumed in the accident analysis. Individual component response times are not modeled in the accident analyses. The analysis models the overall or total elapsed time, from the point at which the parameter exceeds the trip setpoint value at the sensor to the point at which the equipment reaches the required functional state.

2.2 Current TS Requirement

PINGP TS, Section 1.1, "Definitions", states:

> "REACTOR TRIP SYSTEM (RTS) RESPONSE TIME

> The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor output until opening of a reactor trip breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured."

This definition is used in TS SR 3.3.1.16, which states, "Verify RTS RESPONSE TIME is within limits." The applicability of SR 3.3.1.16 to the RTS trip functions is set out in TS Table 3.3.1-1 and currently applies to the following RTS functions:

- 2.a. Power Range Neutron Flux – High
- 2.b. Power Range Neutron Flux – Low
- 3.a. Power Range Neutron Flux Rate – High Positive Rate
- 3.b. Power Range Neutron Flux Rate – High Negative Rate
- 5. Source Range Neutron Flux
- 6. Overtemperature Delta Temperature (OTDT)
- 7. Overpower Delta Temperature (OPDT)

2.3 Reason for Proposed Changes

2.3.1 Revise Definition of RTS RESPONSE TIME

Response time testing is resource intensive and is generally performed in discrete steps, with electronic signal conditioning and logic response time testing being one of the steps. Allocation of response time in lieu of testing will allow more efficient use of station staff, in particular, Instrument and Control (I&C) staff during refueling outages.

2.3.2 Revise Table 3.3.1-1 to Apply SR 3.3.1.16 to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

The TS Bases for SR 3.3.1.16 states, in part, "SR 3.3.1.16 verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analyses." NSPM reviewed the licensing basis and accident analysis assumptions and found that four RTS trip functions that are not currently subject to SR 3.3.1.16 have time delays assumed in the accident analyses. Adding SR 3.3.1.16 RTT to the following four RTS trip functions will make their SR requirements consistent with the TS Bases for SR 3.3.1.16:

- 8.a. Pressurizer Pressure – Low
- 8.b. Pressurizer Pressure – High
- 10. Reactor Coolant Flow – Low
- 13. SG Water Level – Low Low

NSPM captured this difference in the corrective action program. The NSPM licensing basis review also determined that two RTS trip functions that are currently subject to SR 3.3.1.16

have no assumptions in the accident analyses with respect to time delays. Removing SR 3.3.1.16 RTT from the following two RTS trip functions is consistent with the Bases for SR 3.3.1.16:

- 3.b. Power Range Neutron Flux Rate – High Negative Rate
- 5. Source Range Neutron Flux

2.4 Description of Proposed Changes

2.4.1 Revise Definition of RTS RESPONSE TIME

NSPM proposes to revise the TS 1.1 definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME to allow allocation of response time using an approved methodology in lieu of testing. The specific wording changes to the TS are provided in Attachment 1 and 2.

The definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME will be revised to read (additional text in italics):

> "REACTOR TRIP SYSTEM (RTS) RESPONSE TIME
>
> The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor output until opening of a reactor trip breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. *In lieu of measurement, response time may be verified for selected components provided that the components have been evaluated in accordance with an NRC approved methodology.*"

The proposed change will revise the PINGP TS definition of RTS RESPONSE TIME to allow use of an NRC-approved methodology to verify response time for selected components in lieu of testing. NSPM proposes to use the previously approved TSTF-569, Revision 2, Attachment 1, Methodology 2, as the approved methodology for allocating response times to the PINGP NIS and RPS. NSPM proposes to use the methodology documented in Enclosure 2 as the approved methodology for allocating response times to the PINGP PPS.

The proposed TS 1.1 change is supported by changes to the TS Bases 3.3.1, RTS Instrumentation, to be consistent with the proposed definition change. Markups of Bases 3.3.1 are included in Attachment 3 for information.

2.4.2 Revise Table 3.3.1-1 to Apply SR 3.3.1.16 to Appropriate RTS Trip Functions

NSPM proposes to add SR 3.3.1.16 to the SURVEILLANCE REQUIREMENTS column in Table 3.3.1-1 for the following FUNCTIONS:

- 8.a. Pressurizer Pressure – Low

- 8.b. Pressurizer Pressure – High
- 10. Reactor Coolant Flow – Low
- 13. SG Water Level – Low Low

Also, SR 3.3.1.16 will be removed from the SURVEILLANCE REQUIREMENTS column in Table 3.3.1-1 for the following FUNCTIONS:

- 3.b. Power Range Neutron Flux Rate – High Negative Rate
- 5. Source Range Neutron Flux

The specific wording changes to the TS Table 3.3.1-1 are provided in Attachment 1 and 2. There are no associated changes to the Bases for the proposed TS Table 3.3.1-1 changes.

2.4.3 Proposed Methodologies for Allocating Response Times

Allocation of response times to selected components requires an approved methodology. The components of the PINGP NIS and RPS are the same as those evaluated in WCAP-14036-P-A, “Elimination of Periodic Protection Channel Response Time Tests,” (Reference 2) that supports Technical Specifications Task Force (TSTF) TSTF-569, Revision 2, “Revise Response Time Testing Definition.” (Reference 1)

The PINGP PPS is not within the scope of WCAP-14036-P-A. NSPM proposes that the PINGP PPS response time allocation will be evaluated in accordance with the proposed methodology contained in Enclosure 2.

3.0 TECHNICAL EVALUATION

3.1 Justification for Proposed Change to Definition of RTS RESPONSE TIME

3.1.1 Response Time Allocation for Westinghouse NIS and RPS

NSPM proposes to use TSTF-569, Revision 2, Attachment 1, Methodology 2, for allocating response times to PINGP NIS and RPS. TSTF-569, Revision 2, Attachment 1, Methodology 2 is based on Westinghouse Owners Group (WOG) Topical Report WCAP-14036-P-A, "Elimination of Periodic Protection Channel Response Time Tests" (Reference 2), which provides a technical justification for deletion of periodic RTT of the electronic signal processing hardware between the primary sensor and the final actuated device. This Topical Report was approved by the NRC with Safety Evaluation issued October 6, 1998 (Reference 3). The NIS and RPS signal processing hardware evaluated in WCAP-14036-P-A applies to the PINGP excore nuclear instrumentation system and associated solid state and relay trip logic circuitry up to the slave relay output.

3.1.2 Response Time Allocation for Scientech NUS PPS

Prairie Island uses different PPS components than those Westinghouse evaluated in WCAP-14036-P-A. The original PINGP PPS were replaced with Curtiss-Wright Scientech (hereafter Scientech) NUS PPS modules. Similar to the FMEA that Westinghouse completed for WCAP-14036-P-A, Scientech has provided NSPM a FMEA for the PPS that has been incorporated in the proposed methodology included with Enclosure 2. The proposed methodology in Enclosure 2 is similar to previously approved TSTF-569, Revision 2, Attachment 1, Methodology 2.

3.1.3 Sensors

The PINGP TS definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME specifically excludes sensors, therefore, sensors are not addressed in the proposed methodology.

3.1.4 Engineered Safety Function Actuation System (ESFAS) Response Time

The PINGP TS do not include a definition of ESFAS Response Time, therefore, the proposed methodology does not address ESFAS.

3.1.5 Response Time Allocations Based on Proposed Methodology

The following table summarizes time delays resulting from the proposed methodology compared to the time delays assumed in the accident analyses for the RTS trip functions that are proposed to be subject to SR 3.3.1.16:

RTS Trip Function	Time Delay from Proposed Methodology seconds	Accident Analysis Assumed Time Delay seconds
2.a. Power Range High Neutron Flux	0.366	0.45
2.b. Power Range Low Neutron Flux	0.366	0.45
3.a. Power Range High Positive Rate	0.501	0.60
6. Overtemperature Delta Temperature	0.613	6.0
7. Overpower Delta Temperature	0.478	6.0
8.a. Pressurizer Pressure – Low	0.356	1.0
8.b. Pressurizer Pressure - High	0.306	1.0
10. Reactor Coolant Loop Flow - Low	0.306	1.2
13. Steam Generator Level - Low Low	0.306	1.5

The time delay from the proposed methodology in all cases is less than the time delay assumed in the accident analyses,

3.2 Justification for Revisions to Table 3.3.1-1

The PINGP TS Bases for SR 3.3.1.16 states that the SR verifies that the individual channel/train actuation response times are less than or equal to the maximum values assumed in the accident analysis. However, reviews conducted during development of the proposed TS

change to the definition of RTS RESPONSE TIME and development of the proposed methodology of Enclosure 2 found that SR 3.3.1.16 was not being applied to certain RTS trip functions consistent with the TS SR 3.3.1.16 Bases.

In order to align SR 3.3.16 testing requirements with the SR 3.3.1.16 Bases, NSPM proposes the following changes to Table 3.3.1-1:

(1) SR 3.3.1.16 will be added to the SURVEILLANCE REQUIREMENTS Column in TS Table 3.3.1-1 for the following functions:

- 8.a. Pressurizer Pressure – Low
- 8.b. Pressurizer Pressure – High
- 10. Reactor Coolant Flow – Low
- 13. Steam Generator Water Level – Low Low

The addition of SR 3.3.1.16 RTT for these four RTS trip functions will periodically verify that the time delays assumed in the accident analysis for these RTS trip functions remain valid. The response time allocation methodology described above includes and would be applied to the four new functions in addition to the functions that are already subject to SR 3.3.1.16.

(2) SR 3.3.1.16 will be removed from the SURVEILLANCE REQUIREMENTS Column in TS Table 3.3.1.-1 for the following functions:

- 3.b. Power Range Neutron Flux Rate – High Negative Rate
- 5. Source Range Neutron Flux

SR 3.3.1.16 may be removed from these RTS trip functions because the accident analyses include no assumptions about time delays associated with these trips. In particular:

- Function 3.b, Power Range Neutron Flux Rate – High Negative Rate. This trip function is discussed in the dropped rod event analysis. The dropped rod analysis takes no credit for a reactor trip and, therefore, there are no assumed time delays in the accident analysis for Function 3.b.

- Function 5, Source Range Neutron Flux. This trip function is not the credited trip for the rod withdrawal from subcritical (RWFS) analysis (the credited trip is Function 2.b, Power Range Neutron Flux – Low setpoint) and the RWFS analysis includes no time delay assumption for Function 5.

4.0 REGULATORY ANALYSIS

4.1 Applicable Regulatory Requirements/Criteria

4.1.1 10 CFR 50.36

The regulations at Title 10 Code of Federal Regulations (10 CFR) Part 50.36, "Technical specifications," establish the requirements related to the content of the TS. Section 50.36(c)(3) states:

"(3) Surveillance requirements. Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

10 CFR 50.36 sets the regulatory requirements for the content of TS as quoted above. 10 CFR 50.36(c)(3) requires, in part, that the TS contain SRs. The proposed change revises the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME used in TS SR 3.3.1.16 and revises TS Table 3.3.1-1 to apply SR 3.3.1.16 requirements to the appropriate RTS trip functions. The change ensures the RTS response times are consistent with the assumed time delays in the accident analyses. Therefore, 10 CFR 50.36(c)(3) will be met.

4.1.2 Principal Design Criteria

PINGP was designed and constructed to comply with NSPM's understanding of the intent of the Atomic Energy Commission (AEC) General Design Criteria (GDC) for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967. Therefore, the PINGP Licensing Basis requires conformance to the AEC GDC, as reflected in the PINGP Updated Safety Analysis Report (USAR). The following AEC GDC are applicable to the proposed changes:

CRITERION 12 – Instrumentation and Control Systems
Instrumentation and controls shall be provided as required to monitor and maintain variables within prescribed operating ranges.

The proposed change to the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and revision of TS Table 3.3.1-1 will not affect the physical configuration, design, or function of the instrumentation and control systems. The revised SR requirements in Table TS 3.3.1-1 will verify RTS trip function time delays remain within accident analyses assumptions. Therefore, PINGP conformance to Criterion 12 is unaffected by the proposed changes.

CRITERION 14 – Core Protection Systems
Core protection systems, together with associated equipment, shall be designed to act automatically to prevent or to suppress conditions that could result in exceeding acceptable fuel damage limits.

The proposed change to the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and revision of TS Table 3.3.1-1 will not affect the physical configuration, design, or function of the instrumentation and control systems. The revised SR requirements in Table TS 3.3.1-1 will verify the RTS trip function time delays remain within accident analyses assumptions. Therefore, PINGP conformance to Criterion 14 is unaffected by the proposed changes.

CRITERION 19 – Protection Systems Reliability
Protection systems shall be designed for high functional reliability and in-service testability commensurate with the safety functions to be performed.

The proposed change to the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and revision of TS Table 3.3.1-1 will allow allocation of response times in accordance with an approved methodology and will not affect the capability to test protection systems. The revised SR requirements in Table TS 3.3.1-1 will verify the RTS trip function time delays remain within accident analyses assumptions. Therefore, PINGP conformance to Criterion 19 is unaffected by the proposed changes.

4.1.3 Other Criteria Referenced in TSTF-569, Revision 2

Approved Technical Specifications Task Force (TSTF) traveler TSTF-569, “Revise Response Time Testing Definition,” Revision 2 (Reference 1), Section 4.1, Applicable Regulatory Requirements/Criteria, includes a discussion of compliance with NRC Regulatory Guide 1.118, Revision 3, “Periodic Testing of Electric Power and Protection Systems,” which endorses the Institute of Electrical and Electronics Engineers, Inc. (IEEE) Standard 338-1987, “IEEE Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems.” Neither the Regulatory Guide nor the IEEE Standard are included in the PINGP design or license bases for the RTS.

4.2 Precedent

Approved Technical Specifications Task Force (TSTF) traveler TSTF-569, “Revise Response Time Testing Definition,” Revision 2 (Reference 1) provides an NRC-approved methodology for evaluating components and allocating a response time in lieu of testing. NSPM proposes to use the same methodology (specifically, Methodology 2 of Attachment 1 of TSTF-569, Revision 2) previously approved under TSTF-569 for the PINGP NIS and RPS. NSPM proposes to use the methodology of Enclosure 2, which is similar to TSTF-569, Attachment 1 Methodology 2, for allocating response times to the PINGP PPS.

4.3 No Significant Hazards Consideration Determination

Pursuant to 10 CFR 50.90, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), hereby requests an amendment to the Technical Specifications (TS) for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, Renewed Facility Operating License Nos. DPR-42 and DPR-60. The proposed change would revise the definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME used in TS Surveillance Requirement (SR) 3.3.1.16 to allow allocation of response times in lieu of testing using the proposed methodology included here as Enclosure 2.

NSPM also proposes to revise TS Table 3.3.1-1 to apply SR 3.3.1.16 to the RTS trip functions for which the accident analyses include assumptions about time delays.

NSPM evaluated the proposed amendment against the standards in 10 CFR 50.92 and has determined that the operation of the PINGP in accordance with the proposed amendment presents no significant hazards. NSPM's evaluation against each of the criteria in 10 CFR 50.92 follows.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   The proposed change revises the TS Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME to permit NSPM to evaluate using an NRC-approved methodology and apply a bounding response time for some components in lieu of measurement. The requirement for the instrumentation to actuate within the response time assumed in the accident analysis is unaffected.

   The response time associated with the RTS instrumentation is not an initiator of any accident. Therefore, the proposed change has no significant effect on the probability of any accident previously evaluated.

   The affected RTS instrumentation is assumed to actuate its components within the required response time to mitigate accidents previously evaluated. Revising the TS definition for REACTOR TRIP SYSTEM (RTS) RESPONSE TIME to allow an NRC-approved methodology for verifying response time for some components does not alter the surveillance requirements that verify the RTS instrumentation response times are within the required limits. Revising TS Table 3.3.1-1 to apply SR 3.3.1.16 to the appropriate RTS trip functions will not affect the probability or consequences of any evaluated accidents in which those trip functions are credited because the change aligns response time testing to those RTS trip functions for which the accident analyses include assumptions of time delays. As such, the TS will continue to assure that the RTS instrumentation actuate its components within the specified response time to accomplish the required safety functions assumed in the accident analyses. Therefore,

the assumptions used in any accidents previously evaluated are unchanged and there is no significant increase in the consequences.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

   Response: No

   The proposed change revises the TS Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME to permit NSPM to evaluate using an NRC-approved methodology and apply a bounding response time for some components in lieu of measurement. The proposed change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed). The proposed change to the definition does not alter any assumptions made in the safety analyses. The proposed change to the definition does not alter the limiting conditions for operation for the RTS instrumentation, nor does it change the Surveillance Requirement to verify the RTS instrumentation response times are within the required limits. Further, applying SR 3.3.1.16 testing to the appropriate RTS trip functions under the proposed new definition and methodology will not create the possibility of a new or different accident. As such, the proposed change does not alter how the RTS instrumentation meets its safety function, and therefore, does not introduce any new failure modes.

   Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No

   The proposed change revises the TS Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME to permit NSPM to evaluate using an NRC-approved methodology and apply a bounding response time for some components in lieu of measurement. The proposed change has no effect on the required RTS instrumentation response times or setpoints assumed in the safety analyses. The proposed change does not alter any Safety Limits or analytical limits in the safety analysis. The proposed change does not alter how the RTS instrumentation meets its safety function. The RTS instrumentation actuation of the RTS and its components at the required setpoints and within the specified response times will continue to accomplish the design basis safety functions of the RTS and its components in the same manner as before. Further, applying SR 3.3.1.16 testing to the appropriate RTS trip functions under the proposed new definition and methodology will further ensure that the assumptions in the accident analyses for which RTS trip functions are credited will be met. As such, the RTS instrumentation will continue to perform the required safety functions as assumed in the safety analyses for all previously evaluated accidents.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, NSPM concludes that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of “no significant hazards consideration” is justified.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

NSPM has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Technical Specifications Task Force Traveler TSTF-569, Revision 2, “Revise Response Time Testing Definition” (EPID L-2018-PMP-0002) (ADAMS Accession No. ML19176A188)

2. WCAP-14036-P-A, “Elimination of Periodic Protection Channel Response Time Tests,” October 1998

3. NRC Letter (Thomas H. Essig – NRC to Lou Liberatori – WOG), "Safety Evaluation Related to Topical Report WCAP-14036, Revision 1, 'Elimination of Periodic Protection Channel Response Time Tests,' (TAC No. MA0863)," October 6, 1998

ENCLOSURE 1, ATTACHMENT 1

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

License Amendment Request to Revise the Technical Specification Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and Apply Response Time Testing to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

TECHNICAL SPECIFICATION PAGES (Markup)

(4 pages follow)

1.1 Definitions (continued)

PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, and the OPPS arming temperature for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.6. Plant operation within these operating limits is addressed in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) –Reactor Coolant System Cold Leg Temperature (RCSCLT) > Safety Injection (SI) Pump Disable Temperature," and LCO 3.4.13, "Low Temperature Overpressure Protection (LTOP) - Reactor Coolant System Cold Leg Temperature (RCSCLT) ≤ Safety Injection (SI) Pump Disable Temperature."
QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 1677 MWt.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor output until opening of a reactor trip breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

In lieu of measurement, response time may be verified for selected components provided that the components have been evaluated in accordance with an NRC approved methodology.

TBD

TBD

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Manual Reactor Trip	1, 2	2	B	SR 3.3.1.14	NA
	3[a], 4[a], 5[a]	2	C	SR 3.3.1.14	NA
2. Power Range Neutron Flux					
a. High	1, 2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 110% RTP
b. Low	1[b], 2	4	D	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 40% RTP
3. Power Range Neutron Flux Rate					
a. High Positive Rate	1, 2	4	D	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 6% RTP with time constant ≥ 2 sec
b. High Negative Rate	1, 2	4	D	SR 3.3.1.7 SR 3.3.1.11 ~~SR 3.3.1.16~~	≤ 8% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1[b], 2[c]	2	F, G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 40% RTP

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(b) Below the P-10 (Power Range Neutron Flux) interlocks.
(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

Table 3.3.1-1 (page 2 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Source Range Neutron Flux	2(d)	2	H, I	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 ~~SR 3.3.1.16~~	≤ 1.0E6 cps
	3(a), 4(a), 5(a)	2	I, J	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11 ~~SR 3.3.1.16~~	≤ 1.0E6 cps
6. Overtemperature ΔT	1, 2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 1 (Page 3.3.1-23)
7. Overpower ΔT	1, 2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 2 (Page 3.3.1-24)
8. Pressurizer Pressure					
a. Low	1(e)	4	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 1845 psig
b. High	1, 2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 2400 psig

SR 3.3.1.16

SR 3.3.1.16

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
(e) Above the P-7 (Low Power Reactor Trips Block) interlock.

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Table 3.3.1-1 (page 3 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
9. Pressurizer Water Level - High	1(e)	3	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 90%
10. Reactor Coolant Flow- Low	1(f)	3 per loop	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 91%
11. Loss of Reactor Coolant Pump (RCP)				SR 3.3.1.16	
a. RCP Breaker Open	1(f)	1 per RCP	M	SR 3.3.1.14	NA
b. Under-frequency 4 kV Buses 11 and 12 (21 and 22)	1(f)	2 per bus	L	SR 3.3.1.9 SR 3.3.1.10	≥ 58.2 Hz
12. Undervoltage on 4 kV Buses 11 and 12 (21 and 22)	1(e)	2 per bus	L	SR 3.3.1.9 SR 3.3.1.10	≥ 76% rated bus voltage
13. Steam Generator (SG) Water Level - Low Low	1, 2	3 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≥ 11.3%

SR 3.3.1.16

(e) Above the P-7 (Low Power Reactor Trips Block) interlock.
(f) Above the P-8 (Power Range Neutron Flux) or P-7 (Low Power Reactor Trips Block) interlocks.

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ENCLOSURE 1, ATTACHMENT 2

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

License Amendment Request to Revise the Technical Specification Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and Apply Response Time Testing to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

TECHNICAL SPECIFICATION PAGES (Re-typed)

(4 pages follow)

1.1 Definitions (continued)

PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)	The PTLR is the unit specific document that provides the reactor vessel pressure and temperature limits, including heatup and cooldown rates, and the OPPS arming temperature for the current reactor vessel fluence period. These pressure and temperature limits shall be determined for each fluence period in accordance with Specification 5.6.6. Plant operation within these operating limits is addressed in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) –Reactor Coolant System Cold Leg Temperature (RCSCLT) > Safety Injection (SI) Pump Disable Temperature," and LCO 3.4.13, "Low Temperature Overpressure Protection (LTOP) - Reactor Coolant System Cold Leg Temperature (RCSCLT) $\leq$ Safety Injection (SI) Pump Disable Temperature."
QUADRANT POWER TILT RATIO (QPTR)	QPTR shall be the ratio of the maximum upper excore detector calibrated output to the average of the upper excore detector calibrated outputs, or the ratio of the maximum lower excore detector calibrated output to the average of the lower excore detector calibrated outputs, whichever is greater.
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of 1677 MWt.
REACTOR TRIP SYSTEM (RTS) RESPONSE TIME	The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS trip setpoint at the channel sensor output until opening of a reactor trip breaker. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components have been evaluated in accordance with an NRC approved methodology.

Table 3.3.1-1 (page 1 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Manual Reactor Trip	1, 2	2	B	SR 3.3.1.14	NA
	3(a), 4(a), 5(a)	2	C	SR 3.3.1.14	NA
2. Power Range Neutron Flux					
a. High	1, 2	4	D	SR 3.3.1.1 SR 3.3.1.2 SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 110% RTP
b. Low	1(b), 2	4	D	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11 SR 3.3.1.16	≤ 40% RTP
3. Power Range Neutron Flux Rate					
a. High Positive Rate	1, 2	4	D	SR 3.3.1.7 SR 3.3.1.11 SR 3.3.1.16	≤ 6% RTP with time constant ≥ 2 sec
b. High Negative Rate	1, 2	4	D	SR 3.3.1.7 SR 3.3.1.11	≤ 8% RTP with time constant ≥ 2 sec
4. Intermediate Range Neutron Flux	1(b), 2(c)	2	F, G	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 40% RTP

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(b) Below the P-10 (Power Range Neutron Flux) interlocks.
(c) Above the P-6 (Intermediate Range Neutron Flux) interlocks.

Table 3.3.1-1 (page 2 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
5. Source Range Neutron Flux	2(d)	2	H, I	SR 3.3.1.1 SR 3.3.1.8 SR 3.3.1.11	≤ 1.0E6 cps
	3(a), 4(a), 5(a)	2	I, J	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.11	≤ 1.0E6 cps
6. Overtemperature ΔT	1, 2	4	E	SR 3.3.1.1 SR 3.3.1.3 SR 3.3.1.6 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 1 (Page 3.3.1-23)
7. Overpower ΔT	1, 2	4	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.12 SR 3.3.1.16	Refer to Note 2 (Page 3.3.1-24)
8. Pressurizer Pressure					
a. Low	1(e)	4	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 1845 psig
b. High	1, 2	3	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≤ 2400 psig

(a) With Rod Control System capable of rod withdrawal or one or more rods not fully inserted.
(d) Below the P-6 (Intermediate Range Neutron Flux) interlocks.
(e) Above the P-7 (Low Power Reactor Trips Block) interlock.

Table 3.3.1-1 (page 3 of 8)
Reactor Trip System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
9. Pressurizer Water Level - High	1(e)	3	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10	≤ 90%
10. Reactor Coolant Flow- Low	1(f)	3 per loop	K	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 91%
11. Loss of Reactor Coolant Pump (RCP)					
a. RCP Breaker Open	1(f)	1 per RCP	M	SR 3.3.1.14	NA
b. Under-frequency 4 kV Buses 11 and 12 (21 and 22)	1(f)	2 per bus	L	SR 3.3.1.9 SR 3.3.1.10	≥ 58.2 Hz
12. Undervoltage on 4 kV Buses 11 and 12 (21 and 22)	1(e)	2 per bus	L	SR 3.3.1.9 SR 3.3.1.10	≥ 76% rated bus voltage
13. Steam Generator (SG) Water Level - Low Low	1, 2	3 per SG	E	SR 3.3.1.1 SR 3.3.1.7 SR 3.3.1.10 SR 3.3.1.16	≥ 11.3%

(e) Above the P-7 (Low Power Reactor Trips Block) interlock.
(f) Above the P-8 (Power Range Neutron Flux) or P-7 (Low Power Reactor Trips Block) interlocks.

ENCLOSURE 1, ATTACHMENT 3

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

License Amendment Request to Revise the Technical Specification Definition of REACTOR TRIP SYSTEM (RTS) RESPONSE TIME and Apply Response Time Testing to RTS Trip Functions with Time Delay Assumptions in the Accident Analyses

TECHNICAL SPECIFICATION BASES PAGES (Marked-Up)
(Provided for Information Only)

(3 pages follow)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.1.16 (continued)

Response time test is performed with the time constants set to their nominal value, provided the required response time is analytically calculated assuming the time constants are set at their nominal values. ~~The response time may be measured by a series of overlapping tests such that the entire response time is measured.~~

~~Testing of the final actuation devices is included in the testing. Response times cannot be determined during unit operation because equipment operation is required to measure response times.~~

Insert A

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.16 is modified by a Note stating that neutron detectors are excluded from RTS RESPONSE TIME testing. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure a virtually instantaneous response.

Insert A

Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements, or by the summation of allocated signal processing and actuation logic response times with actual response time tests on the remainder of the channel.

The NRC approved methodology of Reference 7 or Reference 8 may be used to allocate signal processing and actuation logic response times to RTS components in the overall verification of the RTS channel response time. The allocations for signal conditioning and actuation logic response times must be verified prior to placing the component in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of the same type and value.

BASES (continued)

REFERENCES

1. Criterion 14 of:
Atomic Energy Commission Proposed Rule Making, Part 50 - Licensing of Production and Utilization Facilities; General Design Criteria for Nuclear Power Plant Construction Permits, Federal Register 32, No. 132 (July 11, 1967): 10213. [NRC Accession Number: ML043310029]

2. Regulatory Guide 1.105, Revision 3, “Setpoints for Safety-Related Instrumentation.”

3. USAR, Section 14.

4. USAR, Section 7.

5. “Engineering Manual Section 3.3.4.1, Engineering Design Standard for Instrument Setpoint/Uncertainty Calculations”.

6. WCAP-10271-P-A, Supplement 2, Rev. 1, June 1990.

7. WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," October 1998.

8. License Amendments TBD/TBD approved mm/dd/yyyy.

ENCLOSURE 2

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

Proposed Methodology to Eliminate Protection Channel Response Time Testing for Prairie Island Nuclear Generating Plant

(74 pages follow)