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August 31, 2016

L-PI-16-060
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 Technical Specification 3.8.7 to Remove Non-Conservative Required Action

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). The proposed change would revise TS 3.8.7 by removing the site-specific Required Actions and associated Completion Times, thus reverting to the standard TS language contained in NUREG-1431.

NSPM has determined that the current PINGP TS Required Action 3.8.7.A.1 for one Reactor Protection Instrument AC inverter inoperable is non-conservative and the guidance of NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications That are Insufficient to Assure Plant Safety," applies. Based on this, NSPM has implemented administrative controls to require a plant shutdown after 24 hours of operation with a Reactor Protection Instrument bus powered via the minimum interruptible buses and is submitting this License Amendment Request (LAR) to address the nonconformance.

The enclosure provides NSPM's evaluation of the proposed change. Attachment 1 to the enclosure provides the marked-up PINGP TS pages. Attachment 2 to the enclosure provides re-typed copies of the PINGP TS pages. Attachment 3 to the enclosure provides the marked-up PINGP TS Bases pages, which are being provided for information only.

NSPM has evaluated the changes proposed in this License Amendment Request (LAR) 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 the enclosure, is being provided to the designated Minnesota official.

NSPM requests approval of the proposed amendment by August 31, 2017, with an implementation period of 90 days.

If there are any questions or if additional information is required, please contact Mr. Shane Jurek at (612) 330-5788.

Summary of Commitments

This letter makes no new commitments and no revisions to existing commitments.

I declare, under penalty of perjury, that the foregoing is true and correct.
Executed on August 31, 2016.

Scott Northard
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
State of Minnesota

ENCLOSURE

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

Evaluation of the Proposed Change

License Amendment Request to Revise Technical Specification 3.8.7 to Remove Non-Conservative Required Action

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 3.8.7 to Remove Non-Conservative Required Action

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 TS 3.8.7 by removing the site-specific Required Actions and associated Completion Times thus reverting to the improved standard TS (ISTS) language as contained in NUREG-1431, Revision 4, "Standard Technical Specifications – Westinghouse Plants" (Reference 1).

NSPM has determined that the current PINGP TS Required Action 3.8.7.A.1 for one Reactor Protection Instrument AC inverter inoperable is non-conservative and the guidance of Nuclear Regulatory Commission (NRC) Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications That Are Insufficient to Assure Plant Safety," applies (Reference 2). Based on this, NSPM has implemented administrative controls to require a plant shutdown after 24 hours of operation with a Reactor Protection Instrument bus powered via the minimum interruptible buses (identified as Panels 117 and 217 for Units 1 and 2, respectively) and is submitting this License Amendment Request (LAR) to address the nonconformance.

2.0 DETAILED DESCRIPTION

2.1 Proposed Changes

A brief description of the associated proposed TS changes is provided below along with a discussion of the justification for the changes. The specific wording changes to the TS are provided in Attachments 1 and 2 to this enclosure.

NSPM proposes a revision to the Required Actions and associated Completion Times to TS 3.8.7, "Inverters – Operating", to remove a non-conservatism. Specifically, Condition B will be deleted and current Condition C will be re-lettered to Condition B. Additionally, the Required Actions and Associated Completion Times for Condition A will be modified to require restoration of one inoperable inverter to OPERABILITY within 24 hours. These changes conform to ISTS TS 3.8.7 as contained in Reference 1.

2.2 Reason for Proposed Changes

NSPM has determined that the current PINGP TS Required Action 3.8.7.A.1 for one inoperable Reactor Protection Instrument AC inverter is non-conservative. This non-conservatism exists based on a lack of train separation for safety related equipment when Panel 117 (217) is aligned to Reactor Protection Instrument AC panels 112 or 114 (212 or 214), without a requirement to restore the inoperable inverter or to shut down the plant. The

non-conservatism was captured in the site Corrective Action Program (CAP) as Action Request (AR) 01473550. Additionally, NSPM determined that the guidance of NRC AL 98-10 applies to the nonconformance. NSPM has implemented administrative controls to require a plant shutdown after 24 hours of operation with a Reactor Protection Instrument bus powered via Panel 117 (217). NSPM is submitting this LAR to address the nonconformance.

2.3 Facility Description

PINGP is a two unit plant located on the right bank of the Mississippi River within the city limits of the city of Red Wing, Minnesota. The facility is owned and operated by NSPM. Each unit at PINGP employs a two-loop pressurized water reactor designed and supplied by Westinghouse Electric Corporation. The initial PINGP application for a Construction Permit and Operating License was submitted to the Atomic Energy Commission (AEC) in April 1967. The Final Safety Analysis Report was submitted for application of an Operating License in January 1971. Unit 1 began commercial operating in December 1973 and Unit 2 began commercial operation in December 1974.

The PINGP was designed and constructed to comply with NSPM's understanding of the intent of the AEC General Design Criteria (GDC) for Nuclear Power Plant Construction Permits, as proposed on July 10, 1967. PINGP was not licensed to NUREG-0800, Standard Review Plan.

3.0 TECHNICAL EVALUATION

3.1 System Description

Units 1 and 2 at PINGP each have four Reactor Protection Instrument AC inverters that each supply a corresponding Reactor Protection AC Panel that is dedicated to one Reactor Protection and Nuclear Instrumentation System channel. The inverters are used to supply highly regulated AC power while minimizing the chance of a loss of power.

Each inverter is fed from a 480 V AC safeguards bus by means of a safeguards Motor Control Center (MCC). The AC supply is rectified to DC and is re-converted to AC. In the inverter DC section, a battery-backed DC supply is paralleled to the rectified DC. Should the normal source fail, the external DC will then supply the inverter and its loads without interruption of power. Should the inverter fail with the normal AC source still available, an automatic static transfer switch will transfer the Reactor Protection AC Panel load from the inverter directly to the normal AC source. If the inverter output fails, the load can be supplied from an external, alternate AC source.

Each unit is also provided with a minimum interruptible bus, denoted as Panel 117 for Unit 1 and Panel 217 for Unit 2. These panels are fed from the Unit's A Train 480 Volt AC safeguards bus via safeguards MCC. Inverter loads are transferred to these panels when the inverter fails or must be removed from service for maintenance. Panel 117 (217) can be aligned to any of the four Reactor Protection AC Panels on the associated unit.

The Reactor Protection Instrument AC inverters are the preferred source of power for the Reactor Protection Instrument AC Panels because of the stability and reliability they achieve.

The inverters ensure the availability of AC electrical power for the instrumentation required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated design basis accident.

3.2 Basis for Current Requirement

Limiting Condition for Operation (LCO) 3.8.7 Condition A, One Reactor Protection Instrument AC inverter inoperable, and the current Required Actions A.1 and A.2 allow for indefinite continued operation with one inoperable inverter so long as that inverter's associated AC Panel is energized via the inverter bypass source or Panel 117 (217). The PINGP TS have included an allowance to power the Reactor Protection Instrument AC Panels via Panel 117 (217) in the event of an inoperable inverter since initial plant licensing, as documented in References 3 and 4. Incorporation of the inverter bypass sources into the TS was approved by the NRC as part of amendments 91 and 84 in 1989 (Reference 5). The NRC approved the current PINGP TS 3.8.7 as part of the conversion to the improved TS in 2002 (Reference 6).

LCO 3.8.7 Condition B, Two required Reactor Protection Instrument AC inverters inoperable, and the current Required Actions B.1, B.2, and B.3 allow for eight hours to restore one inverter to OPERABLE status so long as it is verified within two hours that no more than one Reactor Protection AC Panel is powered via Panel 117 (217). The eight hour limit is based on the recognition that the worst-case scenario of two inoperable inverters (i.e., both inoperable inverters in the same train) is an equivalent level of degradation to that of one inoperable battery. In accordance with LCO 3.8.4, Required Action B.4, eight hours are available to restore a battery to OPERABLE status prior to the commencement of a shutdown; therefore, eight hours is the appropriate Completion Time for Required Action B.3 of LCO 3.8.7.

Panels 117 and 217 were downgraded from safety related to non-safety related in 2010, thereby eliminating the justification for considering the panels reliable to remain functional during a postulated DBA. It was subsequently discovered that this downgrade rendered TS 3.8.7 Required Action A.1 non-conservative. This non-conservatism exists based on a lack of train separation when Panel 117 (217) is aligned to Reactor Protection Instrument AC panels 112 or 114 (212 or 214) without a requirement to restore the inoperable inverter or to shut down the plant. Specifically, for a worst-case single failure with Panel 117 (217) aligned to a Reactor Protection Instrument AC Panel, the required number of instrument buses to initiate an automatic Containment Spray system start would not be energized, thus defeating the automatic start function. The absence of a requirement to restore the Reactor Protection Instrument AC inverter to an OPERABLE status allows for indefinite operation in a condition which defeats the automatic initiation of the Containment Spray system.

3.3 Basis for Proposed Change

The proposed change would adopt the wording of ISTS 3.8.7 into the PINGP TS. That is, the PINGP TS would adopt a 24 hour Completion Time for the condition of having one inverter inoperable. Additionally, the PINGP TS would require immediate entry into LCO 3.0.3 for two or more inoperable inverters.

The 24 hour Completion Time for restoring an inverter to service is based upon the NRC's prior generic approval in the standard TS. The 24 hour Completion Time was first introduced into the standard TS as part of LCO 3.8.3.1 in Revision 4 to NUREG-0452 in 1981 (Reference 7). This approval was subsequently carried forward as part of LCO 3.8.7 into all revisions of NUREG-1431, which was most recently reissued by the NRC in 2012 as revision 4 (Reference 1). NUREG-1431 is applicable to PINGP. Therefore, the 24 hour Completion Time for one inoperable inverter, which has been generically approved by the NRC for use at Westinghouse plants on multiple occasions, is appropriate for incorporation into the PINGP TS.

4.0 REGULATORY ANALYSIS

4.1 Applicable Regulatory Requirements/Criteria

Title 10 Code of Federal Regulations (10 CFR) 50.36(c)(2)

Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

Conclusion

10 CFR 50.36 sets the regulatory requirements for the content of TS as quoted above. 10 CFR 50.36(c)(2) requires, in part, that the TS contain LCOs, and that remedial actions are prescribed for when a nuclear power plant fails to meet an LCO. The proposed change removes allowed remedial actions, which are not specified by the regulation, from the PINGP TS. Therefore, 10 CFR 50.36(c)(2) will continue to be met.

General Design Criteria

As stated in Section 2.3 of this enclosure, PINGP was designed and constructed to comply with NSPM's understanding of the intent of the AEC 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) Section 1.2. The following AEC GDC are applicable to the proposed changes:

> CRITERION 24 – EMERGENCY POWER FOR PROTECTION SYSTEMS
>
> In the event of loss of all offsite power, sufficient alternate sources of power shall be provided to permit the required functioning of the protection system.
>
> CRITERION 39 – EMERGENCY POWER FOR ENGINEERED SAFETY FEATURES
>
> Alternate power systems shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning required of the engineered safety features. As a minimum, the onsite power system and the offsite

power system shall each independently provide this capacity assuming a failure of a single active component in each power system.

Conclusion

The change proposed to the TS will not affect any installed components at PINGP. The change proposed to the TS eliminates a non-conservatism in the Required Actions and results in operation in a manner which ensures train separation in the instrument power system. Therefore, the criteria listed above, and as described in the PINGP USAR, will continue to be met.

4.2 Precedent

The proposed change to the PINGP TS 3.8.7 conforms to the generically approved wording of TS 3.8.7 in the ISTS. The NRC first approved TS 3.8.7 in its current form with Revision 1 to the ISTS in April 1995 (Reference 8). Subsequently, the NRC has approved multiple LARs for licensees transitioning to improved TS with TS 3.8.7 conforming to the language of TS 3.8.7 in the ISTS, most recently at the Sequoyah Nuclear Plant on September 30, 2015 (Reference 9). The Sequoyah Nuclear Plant is a four-loop Westinghouse PWR, and the primary and secondary nuclear plant systems differ from that of PINGP accordingly. However, the configuration of the Reactor Protection Instrument inverters and panels are substantially similar at the two sites, and the Sequoyah approval sets precedent for the proposed change at PINGP.

4.3 No Significant Hazards Consideration Determination

In accordance with the requirements of 10 CFR 50.90, Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter “NSPM”), 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 amendment would change the PINGP TS to remove a non-conservative Required Action.

NSPM has 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 for the purpose of eliminating a non-conservative Required Action**.** The proposed TS change does not introduce new equipment or new equipment operating modes, nor does the proposed change alter existing system

relationships. The proposed change does not affect normal plant operation. Further, the proposed change does not increase the likelihood of the malfunction of any SSC or impact any analyzed accident. Consequently, the probability of an accident previously evaluated is not affected and there is no significant increase in the consequences of any accident previously evaluated.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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 for the purpose of eliminating a non-conservative Required Action. The change does not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operations. The proposed change does not alter assumptions made in the safety analysis. Further, the proposed change does not introduce new accident initiators.

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 a margin of safety?

Response: No

The proposed change revises the TS for the purpose of eliminating a non-conservative Required Action. The proposed change does not alter the manner in which safety limits, limiting safety system settings, or limiting conditions for operation are determined. The safety analysis assumptions and acceptance criteria are not affected by this change.

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 Regulatory 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. NUREG-1431, “Standard Technical Specifications – Westinghouse Plants”, Revision 4.0, dated April 2012, (Agencywide Document Access and Management System (ADAMS) Accession No. ML12100A222).

2. NRC Administrative Letter 98-10, “Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety”, dated December 29, 1998, (ADAMS Accession No. ML031110108).

3. Letter from AEC to Northern States Power (NSP), “Facility Operating License DPR-42 to Operate Prairie Island Nuclear Generating Plant, Unit 1”, dated August 9, 1973 (ADAMS Accession No. ML022140636).

4. Letter from AEC to NSP, “License Amendment 6, Incorporates Broad Possession and Use Limits for Byproduct and Special Nuclear Materials”, dated October 25, 1974, (ADAMS Accession No. ML022140592).

5. Letter from NRC to NSP, “Amendments Nos. 91 and 84 to Facility Operating Licenses Nos. DPR-42 and DPR-60: Technical Specification (TS) Upgrade (TAC Nos. 61081 and 61082)”, dated October 27, 1989, (ADAMS Accession No. ML022210226).

6. Letter from NRC to Nuclear Management Company, LLC (NMC), “Issuance of Amendments Re: Conversion to Improved Technical Specifications (TAC Nos. MB0695 and MB0696)”, dated July 26, 2002, (ADAMS Accession No. ML022070661).

7. NUREG-0452, “Standard Technical Specifications for Westinghouse Pressurized Water Reactors”, Revision 4, dated November, 1981 (Legacy ADAMS Accession No. 8201190295).

8. NUREG-1431, “Standard Technical Specifications – Westinghouse Plants”, Revision 1, dated April 1995, (ADAMS Accession No. ML13196A477).

9. Letter from NRC to Tennessee Valley Authority (TVA), “Issuance of Amendments for the Conversion to the Improved Technical Specifications with Beyond Scope Issues (TAC Nos. MF3128 and MF3129)”, dated September 30, 2015 (ADAMS Accession No. ML15238B499).

ENCLOSURE, ATTACHMENT 1

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

License Amendment Request to Revise Technical Specification 3.8.7 to Remove Non-Conservative Required Action

TECHNICAL SPECIFICATION PAGES (Markup)

(3 pages follow)

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters-Operating

LCO 3.8.7 Four Reactor Protection Instrument AC inverters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Reactor Protection Instrument AC inverter inoperable.	A.1 ----------NOTE---------- Enter the applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating" with any Reactor Protection Instrument AC panel de-energized. ----------	
	Restore Reactor Protection Instrument AC inverter to OPERABLE status.	24 hours
	~~Verify Reactor Protection Instrument AC panel with inoperable inverter is powered from Panel 117 (Unit 2 - Panel 217).~~	~~2 hours~~
	~~OR~~	
	~~A.2 Verify Reactor Protection Instrument AC panel with inoperable inverter is powered from its inverter bypass source.~~	~~2 hours~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~B. Two required Reactor Protection Instrument AC inverters inoperable.~~	~~NOTE Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems-Operating" with any Reactor Protection Instrument AC panel de-energized.~~ ~~B.1 Verify no more than one Reactor Protection Instrument AC panel is powered from Panel 117 (Unit 2 – Panel 217).~~ ~~AND~~ ~~B.2 Verify one or both Reactor Protection Instrument AC panel(s) is powered from an inverter bypass source.~~ ~~AND~~ ~~B.3 Restore one inverter to OPERABLE status.~~	~~2 hours~~ ~~2 hours~~ ~~8 hours~~
B~~C~~. Required Action and associated Completion Time not met.	~~C~~B.1 Be in MODE 3. AND ~~C~~B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage and alignment to required Reactor Protection Instrument AC panels.	7 days

ENCLOSURE, ATTACHMENT 2

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

License Amendment Request to Revise Technical Specification 3.8.7 to Remove Non-Conservative Required Action

TECHNICAL SPECIFICATION PAGES (Re-typed)

(2 pages follow)

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters-Operating

LCO 3.8.7 Four Reactor Protection Instrument AC inverters shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One Reactor Protection Instrument AC inverter inoperable.	A.1 ----------NOTE---------- Enter the applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating" with any Reactor Protection Instrument AC panel de-energized. ---------- Restore Reactor Protection Instrument AC inverter to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage and alignment to required Reactor Protection Instrument AC panels.	7 days

ENCLOSURE, ATTACHMENT 3

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2

License Amendment Request to Revise Technical Specification 3.8.7 to Remove Non-Conservative Required Action

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

(6 pages follow)

BASES (continued)

ACTIONS

A.1 ~~and A.2~~

With one required Reactor Protection Instrument AC inverter inoperable, its associated Reactor Protection Instrument AC panel becomes inoperable until it is re-energized from an alternate source. Panel 117 (Unit 2 – Panel 217), by plant design, can provide reliable power to a Reactor Protection Instrument AC panel with an inoperable inverter. Alternatively, a Reactor Protection Instrument AC panel may be powered by an inverter internal bypass.

For this reason a Note has been included in Condition A requiring entry into the Conditions and Required Actions of LCO 3.8.9, "Distribution Systems – Operating." This ensures that the Reactor Protection Instrument AC panel is re-energized within 2 hours.

Required Action A.1 allows 24 hours to restore the inoperable Reactor Protection Instrument AC inverter to OPERABLE status. The 24 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the Reactor Protection Instrument AC panel is powered from one of its alternate sources, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the Reactor Protection Instrument AC panel is the preferred source for powering instrumentation trip setpoint devices.

~~With one Reactor Protection Instrument AC inverter inoperable, Required Action A.1 and A.2 require verification, within 2 hours, the Reactor Protection Instrument AC panel with an inoperable inverter is powered from Panel 117 (Unit 2 - 217) or verify that the Reactor Protection Instrument AC panel with an inoperable inverter is powered from its inverter bypass source.~~

~~Plant design provides acceptable alternate methods of powering a Reactor Protection Instrument AC panel with an inoperable inverter. Panel 117 (Unit 2 - Panel 217), by plant design, can provide reliable~~

BASES (continued)

~~power to a Reactor Protection Instrument AC panel. Alternatively, a Reactor Protection Instrument AC panel may be powered by an inverter internal bypass. In the event an inverter becomes inoperable, the inverter static transfer bypass switch will automatically bypass, thus providing power to the associated Reactor Protection Instrument AC panel and maintain OPERABILITY. Required Actions A.1 and A.2 require verification that only one Reactor Protection Instrument AC panel is powered from Panel 117 (Unit 2 - Panel 217) or an inverter bypass source. This verification must be completed within 2 hours.~~

~~B.1, B.2, and B.3~~

~~With two Reactor Protection Instrument AC inverters inoperable, the associated Reactor Protection Instrument AC panels are considered to be inoperable unless they are energized from Panel 117 (Unit 2 - Panel 217) or they are automatically re-energized by their inverter static transfer switch.~~

~~For this reason a Note has been included in Condition B requiring the entry into the Conditions and Required Actions of LCO 3.8.9,~~

BASES

ACTIONS B.1, B.2, and B.3 (continued)

"Distribution Systems — Operating." This ensures that the Reactor Protection Instrument AC panel is re-energized within 2 hours. Plant design provides acceptable alternate methods of powering Reactor Protection Instrument AC panels with an inoperable inverter. Panel 117 (Unit 2 - Panel 217), by plant design, can provide reliable power to a Reactor Protection Instrument AC panel. Alternatively, a Reactor Protection Instrument AC panel may be powered by an inverter internal bypass. In the event an inverter becomes inoperable, the inverter static transfer bypass switch will automatically bypass, thus providing power to the associated Reactor Protection Instrument AC panel and maintain OPERABILITY. Therefore, based on plant design, Required Actions B.1 and B.2 require verification that no more than one Reactor Protection Instrument AC inverter will be powered from Panel 117 (Unit 2 - Panel 217) and one or both Reactor Protection Instrument AC panel(s) are powered from an inverter bypass source. This verification must be completed within 2 hours.

Required Action B.3 allows 8 hours to fix the inoperable inverter and return it to service. The 8 hour limit is based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the Reactor Protection Instrument AC panel is powered from its alternate source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the Reactor Protection Instrument AC panel is the preferred source for powering instrumentation trip setpoint devices.

BASES

ACTIONS (continued)

~~C~~B.1 and ~~C~~B.2

If the inoperable devices or components cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and Reactor Protection Instrument AC panels energized from the inverter. The verification of proper voltage output ensures that the required power is readily available for the instrumentation of the RPS and ESFAS connected to the Reactor Protection Instrument AC panels. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

REFERENCES

1. USAR, Section 8.
2. USAR, Section 14.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.9 Distribution Systems-Operating

BASES

BACKGROUND

The onsite safeguards AC and DC electrical power distribution systems are divided by train into two redundant and independent electrical power distribution subsystems. The onsite Reactor Protection Instrument AC Distribution System is divided by channels into four separate subsystems (Ref. 1).

Each AC electrical power subsystem consists of a safeguards 4 kV bus and two 480 V buses. These in turn supply power to distribution panels and motor control centers (MCCs). Each safeguards 4 kV bus has two offsite sources of power as well as a dedicated onsite diesel generator (DG) source. Each safeguards 4 kV bus is normally connected to an offsite source. After a loss of this offsite power source, a transfer to the alternate offsite source is accomplished by a load sequencer, initiated by bus undervoltage relays. If all offsite sources are unavailable, the onsite emergency DG supplies power to the safeguards 4 kV bus. Control power for the 4 kV and 480 V bus breakers is supplied from the safeguards DC distribution system. Additional description of the safeguards AC system may be found in the Bases for LCO 3.3.4, "4 kV Safeguards Bus Voltage Instrumentation," and the Bases for LCO 3.8.1, "AC Sources-Operating."

The AC electrical power distribution system for each train includes the safety related buses and MCCs shown in Table B 3.8.9-1.

The 120 V Reactor Protection Instrument AC panels are arranged in four load groups and are normally powered from inverters. An alternate power supply for the instrument panels is the inverter bypass transformer powered from the same MCC as the associated inverter. Another alternate power supply is from the unit 208/120

BASES

BACKGROUND (continued)

VAC interruptable panel. ~~Use of these supplies is governed by LCO 3.8.7, "Inverters-Operating."~~

There are two independent 125 VDC electrical power distribution subsystems (one for each train). The 125 VDC safeguards electrical power system consists of two independent and redundant safety related DC safeguards electrical power subsystems (Train A and Train B). The sources for each train are a 125 VDC battery, a battery charger, and all the associated control equipment and interconnecting cabling.

The list of the required Reactor Protection Instrument AC and safeguards DC distribution panels is presented in Table B 3.8.9-1.

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the USAR (Ref. 2) assume ESF systems are OPERABLE. The safeguards AC, DC, and Reactor Protection Instrument AC electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the safeguards AC, DC, and Reactor Protection Instrument AC electrical power distribution systems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining power distribution systems OPERABLE during accident conditions in the event of:

a. An assumed loss of all offsite power; and

b. A worst case single failure.