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10 CFR 50.90

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
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Prairie Island Nuclear Generating Plant Unit 1
Docket 50-282
License No. DPR-42
OCT 14 2010

Exigent License Amendment Request to Modify Technical Specifications Surveillance Requirement 3.8.1.10 for Prairie Island Nuclear Generating Plant Unit 1

Pursuant to 10 CFR 50.90, the Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, hereby requests an amendment to the operating license for Prairie Island Nuclear Generating Plant (PINGP) Unit 1. The proposed license amendment request (LAR) requests exigent approval to change surveillance requirement (SR) 3.8.1.10, "AC Sources - Operating." SR 3.8.1.10(c) performs a test of the emergency diesel generator (EDG) in conjunction with a safety injection (SI) signal. The proposed change would allow the 12 Battery Charger to not be energized during the SI testing until a modification is completed during the Unit 1 2011 refueling outage. Prior to start up from the 2011 refueling outage, the 12 Battery Charger will be tested in accordance with SR 3.8.1.10(c).

Enclosure 1 contains an evaluation of the proposed changes. Enclosure 2 contains the marked up Technical Specifications (TS) pages. Enclosure 3 contains the basis for the exigent circumstances and the request for approval under the requirements of 10 CFR 50.91(a)(6).

NSPM has determined that the information for the proposed amendment does not involve a significant hazards consideration, authorize a significant change in the types or total amounts of effluent release, or result in any significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed amendment meets the categorical exclusion requirements of 10 CFR 51.22(c)(9) and an environmental impact assessment does not need to be prepared.

A copy of this submittal, including the Determination of No Significant Hazards Consideration, is being forwarded to the designated State of Minnesota official pursuant to 10 CFR 50.91(b)(1).

NSPM voluntarily entered TS 3.8.1.B on October 9, 2010, 1434 CDT for PINGP Unit 1 EDG due to performance of SR 3.8.1.10(c) without including the 12 Battery Charger load. TS action statement 3.8.1.B requires the EDG to be restored to operable status within 14 days. When the required action of TS 3.8.1.B is not met, TS 3.1.8.F would require the plant to be in MODE 3 (reactor in HOT STANDBY) in 6 hours and to be in MODE 5 (COLD SHUTDOWN) within 36 hours. Therefore, NSPM requests approval of this LAR by 1434 CDT on October 23, 2010. NSPM will implement the LAR immediately upon receipt of NRC approval.

If there are any questions or if additional information is needed, please contact Jon Anderson at 651-388-1121 x7309.

Summary of Commitments

This letter makes the following new commitment:

NSPM will install a modification that will automatically shed the 12 Battery Charger from its normal bus and then repower the charger from the bus within the 60 seconds required by the Prairie Island Nuclear Generating Plant Technical Specifications surveillance requirement 3.8.1.10(c). NSPM will perform the modification during the Unit 1 2011 refueling outage.

No existing commitments have been changed.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on 10/14/2010

Mark A. Schimmel

Mark A. Schimmel
Site Vice President
Prairie Island Nuclear Generating Plant Units 1 and 2
Northern States Power Company - Minnesota

Enclosures (3)

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

ENCLOSURE 1

Evaluation of the Proposed Change

20 pages follow

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, the Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, hereby requests an amendment to the operating license for Prairie Island Nuclear Generating Plant (PINGP) Unit 1. The proposed license amendment request (LAR) requests exigent approval to change surveillance requirement (SR) 3.8.1.10, "AC Sources - Operating." SR 3.8.1.10(c) performs a test of the emergency diesel generator (EDG) in conjunction with a safety injection (SI) signal. The proposed change would allow the 12 Battery Charger to not be energized during the SI testing until a modification is completed during the Unit 1 2011 refueling outage. Prior to start up from the 2011 refueling outage, the 12 Battery Charger will be tested in accordance with SR 3.8.1.10(c).

2.0 DETAILED DESCRIPTION

2.1 Proposed Changes

In this application, NSPM is requesting exigent approval of a change to the PINGP Unit 1 Technical Specifications (TS). The requested change applies to Surveillance Requirement (SR) 3.8.1.10, "AC Sources - Operating."

The current SR reads as follows:

SURVEILLANCE	FREQUENCY
SR 3.8.1.10 ---------------------------NOTES--------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. --- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated safety injection actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and energizes emergency loads in $\leq$ 60 seconds.	24 months

The proposed change would read as follows (new text underlined):

SURVEILLANCE	FREQUENCY
SR 3.8.1.10 ---------------------------NOTES-------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. 3. <u>12 Battery Charger is not required to be energized in SR 3.8.1.10(c) until completion of Unit 1, 2011 refueling outage.</u> ---	
Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated safety injection actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and energizes emergency loads in $\leq$ 60 seconds.	24 months

The proposed change would add the sentence underlined above. The implication of the note is that the plant will not start up (enter MODE 4) until the EDG meets the acceptance criteria of SR 3.8.1.10(c) test with the 12 Battery Charger load properly included.

3.0 TECHNICAL EVALUATION

3.1 Background

On June 24, 2010, PINGP Engineering staff identified a testing configuration that could prevent D2 Diesel Generator and 12 Battery Charger from fulfilling the required design functions following a Loss of Offsite Power coincident with a Loss of Coolant Accident. This testing configuration had been in place since 1999.

During review of the procedure that performs the PINGP Unit 1 Integrated SI Test With a Simulated Loss of Offsite Power (hereafter called Integrated SI test), it was determined that during the pre-initiation and restoration checks, 12 Battery Charger is manually turned off during pre-initiation and manually turned on during the equipment restoration section after load sequencing has occurred. The 12 Battery Charger is designed to remain connected to the bus upon Loss of Offsite Power (LOOP) and reenergize when the EDG repowers the bus during a SI and LOOP event. This condition brings into question the operability of 12 Battery Charger during a SI and LOOP event, and the adequacy of the surveillance procedure as written to meet SR 3.8.1.10 (verification of load sequencing every 24 months).

Further investigation revealed that in 1997, during performance of the Integrated SI test for Unit 1, the 12 Battery Charger stopped running about 30 seconds after bus restoration, which coincides with step 4 of the load sequence scheme. With control room direction, the charger was successfully reset by opening and reclosing the AC input circuit breaker. The charger had been off for about four minutes.

A review of instrumented parameters inside the battery charger indicated that the charger had no internal nonconforming components. Rather, the failure occurred during step 4 of the load restoration scheme. The large motor start during step 4 caused a voltage drop. During this step, the voltage at 12 Battery Charger dropped to about 387 VAC. The 12 Battery Charger is designed with a rated minimum AC input voltage of 422.4 VAC (88% of 480V).

Other station battery chargers are not susceptible to this failure occurring since the bus voltage on these battery chargers does not drop to these levels during EDG loading. This has been demonstrated through repeated successful surveillance testing of the other EDGs with the associated battery charger's load included in the load sequence. Based on the 1997 event, the Integrated SI test procedure was modified to remove the 12 Battery Charger from the test as described above.

The 12 Battery Charger passes all TS 3.8.4 Surveillance tests. No indication of any degradation of the 12 Battery Charger has been observed during testing or normal operation. However, the 12 DC System is considered Operable but non-conforming due to the compensatory measures associated with restarting the 12 Battery Charger.

Compensatory measures have been put in place that provide a reasonable assurance of operability of the 12 Battery Charger and D2 EDG. These compensatory measures include changes to plant emergency and abnormal operating procedures ensuring manual operator action is taken to restore a charger to service based on indication that the charger is not functioning properly.

3.2 Licensing Bases

3.2.1 Updated Safety Analysis Report (USAR)

Section 8.5 of the PINGP USAR contains a description of the Safeguards 125 VDC system. The safeguards 125 VDC Electrical Power System for each unit consists of two independent and redundant safety related DC electrical power subsystems (Train A and Train B). 125 VDC Subsystems 11 and 12 serve Unit 1 and 125 VDC Subsystems 21 and 22 serve Unit 2. Each subsystem consists of one 125 VDC battery, battery charger, and associated distribution equipment. The configurations of the safeguards 125 Volt DC Systems for both units are shown in USAR Figures 8.5-1a, 1b, 2a, and 2b.

The 125 VDC Systems supply instrumentation, control, and motive power to safety related equipment. Redundant safety related equipment is divided between the two DC subsystems associated with each Unit such that loss of one DC subsystem does not affect redundant circuits.

The changes identified in this LAR affect only the PINGP Unit 1 125 VDC system and, therefore, the Unit 2 125VDC system is not affected and is not discussed further.

Safeguards Batteries
There are two safeguards station batteries in PINGP Unit 1, one per 125 VDC Subsystem. The batteries provide a backup DC electrical power to the DC System in the event of the loss of AC power or when the associated battery charger cannot supply the total DC load.

The batteries are flooded vented lead acid storage batteries. Each battery consists of 58 cells nominally. The batteries have a nominal rated capacity (to 1.75 volts per cell) of 1800 amp-hours at an 8 hour discharge rate.

One battery charger is in service on each battery so that the batteries are always at full charge in anticipation of a loss of AC power. This ensures that adequate DC power is available for starting the Emergency Diesel Generators and for other emergency uses. Each battery has been sized to carry expected shutdown loads following a plant trip, and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the required minimum. For each battery system, the minimum terminal voltage is that required to maintain the operability of all components required to operate during a design basis event. Battery sizing determination was also done using the methodology of IEEE-485 as guidance and takes into account minimum expected electrolyte temperature and margin for battery aging. Major loads with their approximate operating times on each battery as well as minimum terminal voltage for each battery are listed in USAR Table 8.5-1 for Unit 1.

For Station Blackout, as discussed in USAR section 8.4.4, PINGP is categorized as a four hour plant. However, PINGP has demonstrated that Alternate AC can be aligned within 10 minutes. Therefore, no coping assessment is required per NUMARC 87-00 Section 7.1.2. The safeguards 125 VDC battery on the Station Blackout (SBO) unit will provide DC power to support actions on the SBO unit for aligning the Alternate AC source to the SBO unit during the 10 minute timeframe and will power one division of safeguards battery chargers. The battery sizing load profile stated in the previous paragraph bounds the battery performance load profile for SBO.

Safeguards Battery Chargers
There are five safeguards battery chargers, one per 125 VDC subsystem plus one portable battery charger. The battery chargers are supplied from the associated safeguards 480 VAC System Motor Control Center (MCC). The battery chargers supply DC electrical power to the connected loads while maintaining the safeguards batteries in a fully charged condition during normal operation when AC charging power is available except as allowed by TS.

Each of the four stationary battery chargers has been sized to recharge its associated partially discharged battery from a voltage of 105 VDC within 24 hours, while carrying its normal load.

The chargers have a nominal rated DC output of 300 amperes at 130 VDC. Both float and equalize voltage are adjustable. The charger input supply rating is 90 amps at 480 VAC.

The battery chargers normally operate in float condition supplying power to the connected loads and charging power to their associated battery. Each battery charger has a three phase AC input circuit breaker and a two pole DC output circuit breaker.

The battery chargers function to give desired output whether the battery is connected or not. The rectifier section of the battery charger ensures that the AC supply system does not become a load on the battery.

One portable battery charger can provide backup service in the event that one of the four stationary battery chargers is out of service. If the portable battery charger is substituted for one of the stationary battery chargers, then the requirements of independence and redundancy between subsystems are maintained.

The battery charger AC input transfer switches and DC output isolation switches allow switching of the normal DC power source from the stationary battery charger to the portable battery charger. These AC input transfer break-before-make switches prevent paralleling the portable and the stationary battery chargers.

Emergency Diesel Generators
Section 8.4 of the PINGP USAR describes the EDG capacity of each unit. Since Unit 1 is the subject of this LAR, only the Unit 1 capabilities are discussed.

Each EDG, as a backup to the normal standby AC power supply, is capable of sequentially starting and supplying the power requirements of one of the redundant sets of engineered safety features for its unit. In addition, in the event of a SBO condition, each EDG is capable of sequentially starting and supplying the power requirements of the hot shutdown (MODE 3, HOT STANDBY in ITS) loads for its unit, as well as the essential loads of the blacked out unit, through the use of manual bus tie breakers interconnecting the 4160V buses as discussed in USAR section 8.4.4.

The Unit 1 EDGs consist of two Fairbanks Morse units each rated at 2750 KW continuous (8760 hr basis), 0.8 power factor, 900 rpm, 4160 Volt, 3-phase, 60 Hertz. The 1,000 hour rating of each EDG is 3000 kilowatts. The 30 minute rating of each unit is 3250 kilowatts maximum. This figure is based on cooling water at a maximum input temperature of 95°F and ambient air at a temperature of 90°F. The limitations imposed by the generator and the heat removal equipment limits the overall 30 minute rating of the system to 3250 kilowatts.

Control voltage for the diesel starting/control system is obtained from 125 VDC System 11 for D1 and DC System 12 for D2. USAR Figures 8.5-1a and 8.5-1b show the 125 VDC distribution for Unit 1. For D1 and D2, loss of DC control power after the engine starts will not stop the engine or interfere with its operation. Direct current power must be restored to stop the engine electrically.

Each EDG is automatically started by either of the following events:

a. Undervoltage, which envelopes loss of voltage (including LOOP), or degraded voltage on the associated 4160 VAC buses (Buses 15 and 16 for D1 and D2 respectively. Automatic starting of the EDGs is initiated by a modified 2-out-of-4 voltage relay scheme on each 4160 Volt bus to which the EDG is to be connected.
b. Initiation of a Safety Injection Signal (both of the affected unit's EDGs start on this signal).

Emergency Diesel Generator Design and Qualification
The redundant onsite standby power sources and their corresponding distribution systems are arranged in the PINGP to meet all the requirements of Safety Guide 6.

EDGs D1 and D2 were sized per AEC Safety Guide 9, Paragraph C-2, which requires the predicted load seen by an EDG not to exceed the smaller of either the 2000 hour rating or 90% of the 30 minute rating. The D1/D2 2000 hour rating is unknown. The continuous rating, which bounds the 2000 hour rating conservatively, is 2750 KW. The D1/D2 30 minute rating is 3250 KW, and 90% of the 30 minute rating is 2925 KW. Therefore, the conservative limit of 2750 KW is placed on D1/D2 predicted loads.

As shown in USAR Table 8.4-1, the maximum predicted sequence load during a Loss of Coolant Accident (LOCA) and LOOP on D1 or D2 is 2573 KW and the maximum predicted steady state load during the same event is 2514 KW. As discussed in USAR Section 8.4.4, the maximum predicted peak load for either D1 or D2 during a Unit 2 SBO event is 2712 KW. All of these predicted loads are less than the conservative limit of 2750 KW; therefore, D1 and D2 continue to meet the loading guidelines of paragraph C-2 of Safety Guide 9.

Preoperational testing was performed on D1 and D2 in accordance with paragraph C-3 of Safety Guide 9.

3.2.2 Technical Specification Requirements

TS 3.8.4, “DC Sources – Operating,” requires that the PINGP Unit 1 Battery Chargers be operable whenever the unit is in MODES 1 – 4. When one battery charger is inoperable (TS 3.8.4.A), along with other actions, the plant must restore the inoperable battery charger to operable status within 8 hours. If the inoperable battery charger cannot be restored to operable status within 8 hours, TS 3.8.4.D would require that NSPM initiate actions to place the unit in a MODE in which the TS 3.8.4.A does not apply by placing PINGP Unit 1 in at least HOT STANDBY within the next 6 hours, and at least COLD SHUTDOWN within the following 36 hours. TS SR 3.8.4.2 functionally tests the battery chargers.

TS 3.8.1, “AC Source – Operating,” requires that the PINGP Unit 1 EDGs be operable whenever the unit is in MODES 1 – 4. When one EDG is inoperable (TS 3.8.1.B), along with other actions, the plant must restore the inoperable EDG to operable status within 14 days. If the EDG cannot be restored to operable status within 14 days, TS 3.8.1.F would require that NSPM initiate actions to place the unit in a MODE in which the TS 3.8.1.B does not apply by placing PINGP Unit 1 in at least HOT STANDBY within the next 6 hours, and at least COLD SHUTDOWN within the following 36 hours.

TS 3.8.1 also contains SRs that functionally test the EDGs. Specifically, TS SR 3.8.1.10(c) requires that the EDG automatically starts from standby conditions from a SI signal and energizes the emergency loads in less than 60 seconds. The SR demonstrates the EDG operation during a loss of offsite power actuation test signal in conjunction with an SI actuation signal. In lieu of actual demonstration of connection and loading of emergency loads, testing that adequately shows the capability of the EDG system to perform these functions is acceptable. This testing includes a series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The basis for this test is that in the event of a Design Bases Accident (DBA) coincident with a LOOP, the EDGs are required to supply the necessary power to Engineered Safety Features (ESF) systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded.

3.3 Technical Assessment

<u>Battery Charger Capabilities</u>
Each of the four stationary battery chargers has been sized to recharge its associated partially discharged battery from a voltage of 105 VDC within 24 hours, while carrying its normal load.

The chargers have a nominal rated DC output of 300 amperes at 130 VDC. Both float and equalize voltage are adjustable. The charger supply rating is 90 amps at 480 VAC.

The battery chargers normally operate in float condition supplying power to the connected loads and charging power to their associated battery. Each battery charger has a three phase AC input circuit breaker and a two pole DC output circuit breaker.

The battery chargers function to give desired output whether the battery is connected or not. The rectifier section of the battery charger ensures that the AC supply system does not become a load on the battery.

One portable battery charger can provide backup service in the event that one of the four stationary battery chargers is out of service. If the portable battery charger is substituted for one of the stationary battery chargers, then the requirements of independence and redundancy between subsystems are maintained.

As described in the USAR, there is another full redundant train consisting of 11 DC battery and its associated 11 Battery Charger. This train is not impacted by the low voltage condition during EDG load sequencing that causes 12 Battery Charger to fail. Therefore, the failure of the 12 Battery Charger is not part of an overall loss of safety function for PINGP Unit 1.

<u>12 Battery Charger Failure</u>
The failure of the 12 Battery Charger during load sequencing is not indicative of a potential common mode failure of the other battery chargers for Unit 2 and the remaining battery charger for Unit 1 under design bases conditions. A review of instrumented parameters inside the 12 Battery Charger indicated that the charger had no internal nonconforming components. Rather, the failure occurred during step 4 of the load restoration scheme. The large motor start caused a voltage drop. During step 4, the voltage at 12 Battery Charger dropped to about 387 VAC. The charger minimum specification is 422.4 VAC (88% of 480V).

During the initial evaluation of the failed 12 Battery Charger the following was determined:

> As the charger is starting up, the firing angle of the Silicon Controlled Rectifiers (SCRs) internal to the charger control circuitry advances to increase the charger output. The angle advances until the float voltage setpoint or current limit is reached. When the voltage drops on the incoming AC source, the firing angle of the

SCRs advances further to compensate as it tries to maintain a constant DC output. When the AC input voltage drops low enough during sequence step 4, the firing angle actually advances further and up to the setpoint at which the SCRs become reverse biased. The SCRs need to be forward biased to be able to conduct and produce DC output. Therefore, when the SCRs become reverse biased, they no longer are able to conduct and produce any output. The condition essentially "locks up" the charger as the SCRs are stuck in a reverse biased condition and cannot return to a forward biased state without removing the AC input power from the charger to allow the control circuit capacitors to discharge. The charger can then be started up normally by returning AC power.

When the low input voltage condition occurs, the charger continues to receive AC input power. However, because of the condition and the design of the charger, the state of the internal circuitry is such that after the low voltage condition on step 4 occurs the charger is unable to produce any output until the control circuitry is reset.

This low voltage input condition does not exist in the other battery chargers as verified by repeated successful performance of the Integrated SI test without failure of other battery chargers. During step 4 of the load restoration, the scheme initiates restoration of the motor-driven Auxiliary Feedwater (AFW) Pump. The D1 EDG does not have this load as a turbine-driven AFW pump is employed. For Unit 1, 11 Safeguards Bus does not include the Motor-Driven Auxiliary Feedwater pump load and, therefore, the 11 Battery Charger does not experience the voltage drop that 12 Battery Charger experiences.

Furthermore, the D5 and D6 EDGs are not a similar design to the D1 and D2 EDGs and have a higher kilowatt rating than D1 and D2. Past surveillance test results indicate that step 4 for D5 and D6 have minimal voltage drop. Therefore, the Unit 2 battery chargers are not susceptible to this low voltage input condition.

Given the similarity in loading and response for D1 and D2, it is expected that all load sequence steps on D2 other than step 4 would function properly with the battery charger loaded onto the EDG, because they function properly on D1 with the battery charger connected.

<u>Battery Mission Time</u>
The PINGP USAR states that each battery has been sized to carry expected shutdown loads following a plant trip and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the required minimum. Therefore, time is available within the battery mission time to perform compensatory actions to restore the 12 Battery Charger following a low voltage failure. In addition, an evaluation was performed that demonstrated 12 Battery can function up to two hours and 35 minutes without the charger prior to reaching minimum terminal voltage.

This evaluation utilizes design bases calculation information and testing data to develop a time when the 12 Battery Charger must be reconnected to the AC supply after disconnection for any reason. The 12 Battery discharge test evaluates the capability of the 12 Battery using a four hour discharge test (Modified Performance Test) with battery discharge current of 472 A for one minute and 364 A for the remainder of the four hour period. The test verifies terminal voltage is >109.55 VDC after 60 minutes, which is the design basis, but the discharge test is continued for four hours. This load profile (continuous discharge current of 364 A) is considerably higher than the actual load profile evaluated in the calculation. The 109.55 VDC is the minimum required terminal voltage from the calculation. At this voltage, devices will operate and perform their required safety function. This evaluation determined the time when the battery terminal voltage reaches 109.55 VDC. The results of the evaluation determined a required time to reconnect the 12 Battery Charger to the AC supply source of two hours and 35 minutes to meet DC battery minimum voltage requirements. This time conservatively includes a margin of 10 minutes.

Compensatory Measures

If 12 Battery Charger is not functioning properly, the Control Room will receive two alarms:

- 47024-1105, "12 DC System Trouble"
- 47024-1204, "12 DC Panel Undervoltage"

Both annunciator response guides provides Operators with information to rapidly diagnose a failure of the battery charger. Both annunciator response guides direct Operators to the same abnormal operations procedure.

The abnormal operations procedure directs Operators to record the indications, and then to attempt a restart of 12 Battery Charger by opening the AC input breaker, waiting 10 seconds, and reclosing the AC input breaker. From observations, this action takes less than two minutes not including travel time to the 12 Battery room. The charger has not failed to restart under these specific circumstances. This provides confidence that the 12 Battery Charger will function during an undervoltage event with manual operator action.

In addition, currently and until the refueling outage in the spring of 2011, the Portable Battery Charger is stationed in the 12 Battery Room unless needed to support other required TS actions. In the event of a complete failure of the 12 Battery Charger, the close proximity of the portable charger to the 12 Battery Charger will facilitate replacement of the 12 Battery Charger.

Should the 12 Battery Charger fail to respond from a low voltage condition:

- Procedural controls exist to direct Operators to reset the 12 Battery Charger
- Operations is trained to reset the 12 Battery Charger and procedural guidance exists to complete the reset of the charger within one hour of 12 Battery Charger failure

Changes were made to procedures 1C20.9 AOP4, "12 Battery Charger Failure" and 1E-0, "Reactor Trip of Safety injection" - Attachment L, "SI Alignment Verification".

1E-0, Rev. 26 Attachment L was revised in July 2010 to add a step to the end of the verification of the SI alignment portion of the attachment, directly before checking on event classification initiation and checking on establishment of NRC communications. This change directs operators to use procedure1C20.9 AOP4 in an abnormal condition. The new action is consistent with existing actions in scope and location, and the addition of an action that takes a short time to complete does not impact any existing time critical actions.

In 1C20.9 AOP4 the procedure change consists of adding a notation indicating a time constraint for completing restoration of the battery charger if restoration is required. This change adds no new actions, makes no changes to the existing actions, is not a change of intent, and makes no change to the existing sequence of actions.

The procedure changes described above are currently being evaluated as compensatory measures in accordance with plant processes. Procedures to add compensatory measures were previously revised, additional procedure changes are in progress to strengthen the compensatory measures, and a review of the compensatory measures is in progress.

Previous discharge test data and evaluation conservatively conclude that the 12 Battery would be able to maintain design loads for two hours and 35 minutes.

Operations Training Department found that operator required actions in 1E-0 could be completed through Attachment L and 1C20.9 AOP4 for battery charger restart within one hour. This is supported by a simulation set-up as a LOOP and SI event with a 12 Battery Charger failure performed on July 2, 2010. The result of the simulation was that operators were able to complete 1E-0 up to abnormal status indication identification in Attachment L within eight minutes, 36 seconds. Considering this, there is reasonable assurance that operators will be able to perform compensatory measures in sufficient time.

NSPM is also providing a dedicated operator on each shift to perform the required actions to restore the 12 Battery Charger until the long-term solution described below is implemented. This dedicated operator will have responsibility to restart the 12 Battery Charger, as necessary, upon initiation of an undervoltage event.

<u>Long Term Solution</u>
NSPM is planning a modification to the 12 Battery Charger that will automatically shed the battery charger during an undervoltage event (e.g. LOOP, SI with LOOP or other undervoltage condition) and then repower the battery charger back on the bus within the 60 seconds required by the current TS. NSPM intends to perform the modification during the Unit 1 2011 refueling outage. Based on this, NSPM is making the following commitment to the NRC:

NSPM will install a modification that will automatically shed the 12 Battery Charger from its normal bus and then repower the charger from the bus within the 60 seconds required by the Prairie Island Nuclear Generating Plant Technical Specification surveillance requirement 3.8.1.10(c). NSPM will perform the modification during the Unit 1 2011 refueling outage.

This modification is justified for the following reasons:

- The modification will restore compliance with the TS. The requirement to energize the loads from the EDG will be met rather than having the 12 Battery Charger deenergized during the test.
- The time frame for completion of the modification is justified in that the modification process needs time to order parts, prepare work packages and perform work. Performing this modification in an outage provides the best opportunity to perform the modification because of time out of service required for both the battery charger and the associated motor control center to accommodate both installation and testing.

<u>Description of the Operator Actions</u>
The NRC provides guidance regarding the requirements for manual actions.

In the NRC Inspection Manual part 9900, the NRC discussed the conditions under which manual actions may be used in lieu of automatic actions for safety-system operations. Information Notice (IN) 97-78 alerted licensees to the importance of considering the effects on human performance of such changes made to plant safety systems.

The guidance presented in NUREG-1764, Guidance for the Review of Changes to Human Actions, can be used to address safety-related operator actions (SROAs), as well as other required operator actions. The American National Standards Institute/American Nuclear Society defined "safety-related operator action" in ANSI/ANS-58.8-1994, as follows:

> *"A manual action required by plant emergency procedures that is necessary to cause a safety-related system to perform its safety-related function during the course of any DBE (design-basis event). The successful performance of a safety-related operator action might require that discrete manipulations be performed in a specific order."*

NUREG-1764 provides guidance for the review of human actions. This document provides guidance for use in determining the appropriate level of human factors engineering (HFE) review of human actions (HAs) based upon their risk-importance. This guidance uses a graded, risk-informed (RI) approach that is consistent with Regulatory Guide (RG) 1.174, Rev. 1.

This guidance uses a two-phased approach to reviewing HAs. Phase 1 is a risk screening and analysis of the affected HAs identified to determine their risk-importance and the level of HFE review that is appropriate in Phase 2. The second phase is an HFE review of those HAs that are found to be risk-important. This approach can be accomplished for licensee submittals that are either risk-informed or nonrisk-informed.

Description of manual action - The following specific operator actions are required when notified by the control room that they have received an annunciator for 12 DC system trouble or 12 DC panel under voltage.

- An operator then proceeds from his current location to the 12 Battery room and uses a controlled copy of 1C20.9AOP4.
- The operator records data from Attachment A (1 page)
- The operator then performs a restart of the 12 battery charge using Attachment B (1 page) which entails six steps to start the charger including two (2) manipulations.

In Attachment B the manual start of the 12 Battery Charger is straightforward and simple to perform. The six steps are summarized below with the final three simple steps completing the restart of 12 Battery Charger:

- Check indications on 12 Battery Charger
- Verify indications are acceptable.
- Verify 480V Bus 121 voltage is stable and greater than 430 VAC
- Open 12 Battery Charger AC Input Breaker.
- Wait about 10 seconds.
- Close 12 Battery Charger AC Input Breaker.

Operators would then observe the 12 Battery Charger re-start after a 5 - 15 second delay. Verification of proper battery charger operation is performed to ensure the battery chargers are maintaining the batteries on a float charge. Proper operation can be determined by the use of Emergency Response Computer System (ERCS), control board alarms, or local observation.

The operator actions are performed in the 12 Battery Room, which is classified as a mild service environment. There are multiple paths to access the 12 Battery Room for the turbine building operator from Unit 1 and each level from Unit 2 provides access to Unit 1(695', 715' and 735').

Indication of the need for the manual action - As described above either of two alarms or both alarms will indicate a low voltage condition on the 12 DC bus. If 12 Battery Charger stops running, the control room will receive two alarms:

- 47024-1105, "12 DC System Trouble"
- 47024-1204, "12 DC Panel Undervoltage"

Procedural Direction - Both annunciator response guides for the above alarms provide operators with information to rapidly diagnose a failure of the battery charger. Both annunciator response guides direct operations to the same abnormal operations procedure.

Procedure changes were made to procedures 1C20.9 AOP4, "12 Battery Charger Failure" and 1E-0, "Reactor Trip of Safety injection" - Attachment L, "SI Alignment Verification".

1E-0, Rev. 26 Attachment L was revised to add a step to the end of the verification of the SI alignment portion of the attachment, directly before checking on event classification initiation and checking on establishment of NRC communications. This change leads operators to 1C20.9 AOP4 in an abnormal condition. The new action is consistent with existing actions in scope and location, and the addition of an action that takes a short time to complete does not impact any existing time critical actions.

In 1C20.9 AOP4, the procedure change consists of adding a notation indicating a time constraint for completing restoration of the battery charger if restoration is required. This change adds no new actions, makes no changes to the existing actions, is not a change of intent, and makes no change to the existing sequence of actions.

The procedure changes described above are currently being evaluated as compensatory measures in accordance with the plant processes. Procedures to add compensatory measures were previously revised, additional procedure changes are in progress to strengthen the compensatory measures, and a review of the compensatory measures is in progress.

Control Room Plant Reference Simulator and Operator Training – Operations has performed the following training to support the compensatory measures described above.

Operations training:
The following lists the training the operators receive specifically on the DC distribution and the AOPs associated with starting the Battery Charger.

1. Initial Non-licensed operators received training on DC distribution. This was taught in September 2010, May 2009, and December 2008.

2. Non-Licensed Operators received continuing training on DC distribution. This training was complete in December 2009. This lesson plan specifies "How to respond to a loss of AC to Battery Charger." 1C20.9 AOP3(4).

3. Non-Licensed Operators performed JPMs to "Shutdown of the portable battery charger and Restart of the 11(12) Battery charger" in Cycle 08C in April and May 2009 and again with cycle 10A in November 2009.

4. Assistant Plant Equipment Operator (APEO) performed OJT-TPE "Install and remove portable battery charger" January 2009 through May 2010.

5. APEO performed On the Job Training – Task Performance Evaluation (OJT-TPE) "Respond to a Battery charger AC failure." February 2009 through May 2010.

6. APEO performed OJT-TPE "Operate the DC distribution system." February 2009 through March 2010.

7. An Operations Instruction (OI) was implemented to instruct each operator that the action to place the 12 Battery Charger in service after it fails within one hour is the USAR stated mission time. This OI also provides guidance to have the Unit 2 Turbine Building Operator assist with Attachment J of 1E-0 so that Unit 1 Turbine building operator will not be delayed in restarting 12 Battery Charger (Attachment L).

Simulator training:
A simulation of an SI and LOOP event was performed on the Prairie Island Training Center's control room simulator on July 2, 2010. The purpose of the simulation was to time how long it would take for operators to complete required actions in 1E-0 through Attachment L. The timing started from when the SI signal was initiated, and stopped when the operator noticed 12 Battery Charger status indication was abnormal according to Attachment L. The time for completion was eight minutes and 36 seconds. Continuing actions would be to contact an outplant operator to check and eventually restart the charger per 1C20.9 AOP4, attachment B.

In addition, a demonstration by an operator to perform those tasks required after being notified by the control room of these annunciators was conducted. The operator required 10 minutes and 53 seconds to get the procedure and complete all applicable portions of 1C20.9AOP4. This combined with the 8 minutes 36 seconds for the control room actions results in 19 minutes and 29 seconds. This same operator was timed with the assumption that the installed battery charger failed and using a different part of the same procedure performed a connection and start of the portable battery charger. This action required 16 minutes and 38 seconds and again combined with the 8 minutes and 36 seconds results in 25 minutes and 14 seconds.

Based on the above simulations and demonstrations, it is reasonable to conclude that the operator required actions in 1E-0 can be performed through Attachment L within 1 hour and that compensatory measures to restart 12 Battery Charger could be completed as required.

<u>Emergency Diesel Generator Loading and Capability</u>
Plant calculations indicate that for an SI event concurrent with a Loss of Offsite power the impact of the battery charger on any of the EDGs to be 54.62 kW. These calculations also show that the total step 1 loading (the battery chargers load at step 1) is 1221.73 kW including the battery charger. The battery charger is only 4.5% of the total step 1 load. It is expected that the actual load for the battery charger would be less. With the battery charger remaining loaded it is reasonable to conclude that the EDG would still successfully start and take the plant loads.

Calculations for Unit 1 EDG loading indicate that the load for both 11 and 12 Battery Chargers have been accounted for in the calculations with the ratings indicated above. Specific to D2 EDG the 12 Battery Charger is included as a step one load rated at 54.62 kW. The calculation demonstrates a margin of approximately 238 kW for D2 EDG loading compared to the full rating of the EDG (2750 kW). The battery charger increased in load rating from 29.78 kW previously to the currently installed rating of 54.62 kW, not a significant load change.

If the 12 Battery Charger is on the bus during performance of the Integrated SI Test, the voltage profile is not expected to be any different than the Integrated SI tests that were performed in the 1990s when the 12 Battery Charger was on the bus and locked up. This is based on the fact that the 12 Battery Charger was a load during those 1990 tests in steps 0 through 3. In addition, the starting kVA in step 4 does not include the 12 Battery Charger as the charger is a preload at step 4 and not a starting load. Therefore, it is demonstrated from previous tests that the diesel will perform its function if the charger was connected to the bus such as in a real event.

Further, downstream loads (that is other loads that sequence on step 4) have not been affected by the voltage drop like the 12 Battery Charger. During the Integrated SI testing performed both prior to and subsequent to the 12 Battery Charger lockout, no other components have failed to load due to insufficient voltage.

Currently, steps 5 and 6 have very minimal voltage dip. These steps have much less starting load compared to other steps. Therefore, if the battery charger was present as a preload condition on these steps, it would not be expected to change the voltage and frequency response from what is shown in the tests.

3.4 Conclusion

The results of the evaluation indicate the following:

Design and Licensing bases for the 12 Battery and 12 Battery Charger are being maintained by the proposed TS change. The 12 Battery's mission time is one hour and that is sufficient time to restore the 12 Battery Charger to full functional status with the described compensatory actions. Immediately upon initiation of a SI event coincident with a loss of offsite power, the 12 Battery will support the station loads as necessary. Therefore, there is no loss of function during the one hour period prior to the compensatory measure being performed.

Finally, NSPM had committed to a long term solution that will return the plant to full automatic response by the end of the PINGP Unit 1, 2011 refueling outage.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

PINGP General Design Criteria (GDC)-2, "Performance Standards," as discussed in the PINGP USAR, Section 8, requires, in part, that systems be designed to performance standards to withstand forces that might reasonably be imposed by the occurrence of extraordinary natural phenomenon.

To satisfy GDC 2, all electrical systems and components vital to plant safety, including the Emergency Diesel Generators, are designed as Class I systems so that their integrity is not impaired by the Design Basis Earthquake, wind, storms, floods, or disturbances to the external electrical system. Power, control and instrument cabling, motors and other electrical equipment required for operation of the engineered safety features are suitably protected against the effects of either a Design Basis Accident, or of severe external environmental phenomena in order to assure a high degree of confidence in the operability of such components in the event their use is required.

PINGP GDC-39, "Emergency Power," as discussed in the PINGP USAR, Section 8, requires, in part, that an emergency power source shall be provided and designed with adequate independency, redundancy, capacity, and testability to permit the functioning of the engineered safety features (ESFs) and protection systems. This power source shall provide this capacity assuming a failure of a single active component.

To satisfy GDC 39, independent alternate power systems are provided with adequate capacity and testability to supply the required engineered safety features and protection systems. The plant is supplied with emergency power in the form of two emergency diesel generator sets dedicated to each Unit. Two emergency diesel generator sets are dedicated to each Unit and are connected to the engineered safety features (safeguards) buses to supply shutdown power in the event of loss of all other AC auxiliary power.

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(3), "Technical Specifications," requires a licensee's TSs to have SRs relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operations are within safety limits, and that the limiting conditions for operation will be met.

The AC sources (emergency diesel generators) satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

4.2 No Significant Hazards Consideration

Pursuant to 10 CFR 50.90, the Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy, hereby requests an amendment to the operating license for Prairie Island Nuclear Generating Plant (PINGP) Unit 1. The proposed license amendment request (LAR) requests exigent approval to change surveillance requirement (SR) 3.8.1.10, "AC Sources - Operating." SR 3.8.1.10(c) performs a test of the emergency diesel generator (EDG) in conjunction with a safety injection (SI) signal. The proposed change would allow the 12 Battery Charger to not be energized during the SI testing until a modification is completed during the Unit 1 2011 refueling outage. Prior to start up from the 2011 refueling outage, the 12 Battery Charger will be loaded onto the D2 EDG and tested as required by SR 3.8.1.10(c).

NSPM has evaluated whether or not a significant hazards consideration is involved with the proposed changes by focusing on the three standards set forth in 10 CFR 50.92(c) as discussed below:

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

   Response: No

   The probability or consequences of accidents previously evaluated in the Updated Safety Analysis Report are unaffected by this proposed change. There is no change to any equipment response or accident mitigation scenario, and this change results in no additional challenges to fission product barrier integrity. The proposed change does not alter the design, configuration, operation, or function of any plant system, structure, or component in a way that significantly increases the probability or consequences of an accident. As a result, the outcomes of previously evaluated accidents are unaffected.

   The proposed change adds a Technical Specifications note for the emergency diesel generator integrated safety injection with a loss of offsite power test. The note will not require the 12 Battery Charger to be energized by the test until prior to entering MODE 4 during the 2011 refueling outage for PINGP Unit 1. The analysis evaluates operator actions that may be taken in the event of a 12 Battery Charger failure and the ample time to implement such actions based on 12 Battery design.

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

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

Response: No

No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. The proposed change does not challenge the performance or integrity of any safety-related system. The proposed change does not install or remove any plant equipment. The proposed change has no adverse effects on any safety related systems or components and does not challenge the performance or integrity of any safety related system. No physical changes are being made to the plant, so no new accident causal mechanisms are being introduced.

The proposed change adds a Technical Specifications note for the emergency diesel generator integrated safety injection with a loss of offsite power test. The note will not require the 12 Battery Charger to be energized by the test until prior to entering MODE 4 during the 2011 refueling outage for PINGP Unit 1. The analysis evaluates operator actions that may be taken in the event of a 12 Battery Charger failure and the ample time required to implement such actions based on 12 Battery design.

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 amendment involve a significant reduction in a margin of safety?**

Response: No

Margin of safety is related to the ability of the fission product barriers to perform their design functions during and following accident conditions. These barriers include the fuel cladding, the reactor coolant system, and the containment. The proposed amendment request does not involve a change to any of these barriers.

12 Battery has been sized to carry expected shutdown loads following a plant trip, and a loss of AC battery charging power for a period of 1 hour without battery terminal voltage falling below the required minimum. The change to a manual action for restart of the 12 Battery Charger does not change or affect any margin associated with the 12 Battery.

The margin of safety associated with the acceptance criteria of any accident is unchanged. The proposed change will have no affect on the availability, operability, or performance of the safety-related systems and components. The ability of operable structures, systems, and components to perform their designated safety function is unaffected by this proposed change. The proposed change does not involve a significant reduction in a margin of safety because the proposed changes do not reduce the margin of safety that exists in the present PINGP Technical Specifications or USAR. The operability requirements of the Technical Specifications are consistent with the initial condition assumptions of the safety analyses.

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

Therefore, based on the above, NSPM has concluded that the proposed amendment presents no 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 CONSIDERATIONS

A review 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. 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 effluents 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.

ENCLOSURE 2

Markup to TS Section 3.8.1 – AC Sources-Operating
Prairie Island Nuclear Generating Plant

TS page 3.8.1-10

1 page follows

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.10	---------------------------NOTES------------------------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. 3. 12 Battery Charger not required to be energized in SR 3.8.1.10(c) until completion of Unit 1, 2011 refueling outage. --- Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated safety injection actuation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses; and c. DG auto-starts from standby condition and energizes emergency loads in ≤ 60 seconds.	24 months
SR 3.8.1.11	---------------------------NOTE-------------------------- All DG starts may be preceded by an engine prelube period. --- Verify on an actual or simulated loss of offsite power signal that the DG auto-starts from standby condition.	24 months

ENCLOSURE 3

Basis for Exigent Circumstances and
Request for Approval under the Requirements of 10CFR50.91(a)(6)

2 pages follow

As required by 10 CFR 50.91(6)(vi) licensees requesting approval of amendments to the operating license under exigent circumstances must explain the exigency and why the licensee cannot avoid it. Below are the reasons for the unavoidable exigent circumstances for Prairie Island Nuclear Generating Plant (PINGP) Unit 1.

The Reason for the Exigent Technical Specification Change

On October 8, 2010, the NRC staff notified Northern States Power Minnesota (NSPM) during a telephone conference that without Integrated Safety Injection testing that included the 12 Battery Charger then Technical Specifications (TS) surveillance requirement (SR) 3.8.1.10(c) was not met. TS 3.8.1.10(c) requires the Emergency Diesel Generator (EDG) to start and load within 60 seconds all required loads. Since the 12 Battery Charger had not been loaded onto the bus during the test, the NRC indicated that this was not a missed surveillance test, but rather a failure to perform a surveillance test. Therefore, based on NSPM review of the NRC's position and after consultation with plant staff, NSPM determined on October 9, 2010, that this condition rendered the PINGP Unit 1, D2 EDG inoperable. Consequently, at 1434 CDT on October 9, 2010, NSPM voluntarily entered TS 3.8.1.B.

In accordance with plant procedures, operations verified paths from the grid to U1 buses and determined that a common cause failure does not exist with D1 Diesel Generator because 11 Battery was satisfactorily tested as a load to D1 Diesel Generator during past integrated safety injection tests. D2 Diesel Generator is still being considered available for Probabilistic Risk Assessment purposes.

Approval of the License Amendment Request (LAR) would restore PINGP Unit 1 into compliance with TS 3.8.1.B. If the LAR is not approved within the 14-day period current PINGP TS 3.8.1.F would require that NSPM initiate actions to place the unit in a MODE in which the TS 3.8.1.B does not apply by placing PINGP Unit 1, in at least HOT STANDBY within the next 6 hours, and at least COLD SHUTDOWN within the following 36 hours. Therefore, since there is no impact on plant safety and in order to prevent an unnecessary plant shutdown, review and approval of this LAR is requested to be completed by October 23, 2010 under the rules of 10 CFR 50.91(a)(6).

Why the Need for the Requested Action Could Not Reasonably Have Been Identified Earlier

NSPM had previously recognized the condition of the battery charger and had been administratively controlling its function during the integrated safety injection testing procedure.

However, on October 8, 2010 during a telephone conference, NSPM was questioned by the NRC whether this constitutes failure to completely test the full capacity of the EDG during a postulated event. After review, NSPM voluntarily entered TS 3.8.1.B on October 9, 2010, 1434 CDT for PINGP Unit 1 EDG due to performance of SR 3.8.1.10(c) without including the 12 Battery Charger load. Therefore, the need for the exigent TS change request could not have reasonably been identified earlier.