UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT DOCKET NO. 50-282
50-306

REQUEST FOR AMENDMENT TO
OPERATING LICENSES DPR-42 & DPR-60

LICENSE AMENDMENT REQUEST DATED March 20, 1992

Northern States Power Company, a Minnesota corporation, requests authorization for changes to Appendix A of the Prairie Island Operating License as shown on the attachments labeled Exhibits A, B, and C. Exhibit A describes the proposed changes, describes the reasons for the changes, and contains a significant hazards evaluation. Exhibits B and C are copies of the Prairie Island Technical Specifications incorporating the proposed changes.

This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By _____
Thomas M Parker
Manager
Nuclear Support Services

On this 20th day of March 1992 before me a notary public in and for said County, personally appeared Thomas M Parker, Manager Nuclear Support Services, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof, and that to the best of his knowledge, information, and belief the statements made in it are true and that it is not interposed for delay.

Marcia K LaCore

MARCIA K. LaCORE
NOTARY PUBLIC—MINNESOTA
HENNEPIN COUNTY
My Commission Expires Sept. 24, 1993

Exhibit A

Prairie Island Nuclear Generating Plant
License Amendment Request Dated March 20, 1992

Evaluation of Proposed Changes to the
Technical Specifications, Appendix A, of
Operating Licenses DPR-42 & DPR-60

Pursuant to 10 CFR Part 50, Sections 50.59 and 50.90, the holders of Operating Licenses DPR-42 and DPR-60 hereby propose the following changes to Appendix A, Technical Specifications:

BACKGROUND

Prairie Island Nuclear Generating Plant, Units 1 and 2, currently operate with auxiliary electrical systems employing two emergency diesel generators (D1 and D2) which are shared between the two units. Under what is referred to as the Station Blackout/Electrical Safeguards Upgrade Project (SBO/ESU Project), Northern States Power Company (NSP) is installing two new emergency diesel generators (D5 and D6) and associated equipment at the Prairie Island Nuclear Generating Plant. The two currently installed emergency diesel generators will be dedicated to Unit 1 and certain common equipment while the two new emergency diesel generators will be dedicated to Unit 2 and certain common equipment. The new auxiliary electrical systems configuration at Prairie Island along with related SBO/ESU Project improvements and upgrades will significantly improve overall plant safety.

These plant changes are described in detail in the SBO/ESU Project Design Report (Reference 1) submitted to NRC on November 27, 1990 and updated by Revision 1 (Reference 2) submitted on December 23, 1991. In those submittals, we committed to provide the necessary License Amendment Request.

Although detailed information is provided in the Design Report, a summary of the scope of SBO/ESU Project changes is presented here.

Scope and Description of Modifications

The SBO/ESU Project modifications consist of the following major activities:

(1) D5/D6 Emergency Diesel Generator addition including the addition of auxiliary support systems;
(2) New D5/D6 Diesel Generator Building addition;
(3) Electrical Safeguards modifications including new 4kV and 480V switchgear additions;
(4) Plant interface connections to equipment within the existing structures; and
(5) Upgrade of #121 Vertical Motor-Driven Cooling Water Pump for safeguards use.

The scope of each activity is described in more detail below:

D5/D6 Diesel Generator Addition

The two new diesel generators (D5/D6) will be added to the Prairie Island Nuclear Generating Plant. These diesel generators will provide emergency AC power to the Unit 2 safeguards buses and will be provided with connection capability to serve as alternate AC power sources for Unit 1 in the event of a station blackout on Unit 1. The two existing emergency diesel generators (D1/D2) will provide emergency AC power to the Unit 1 safeguards buses and will be provided with connection capability to serve as alternate AC power sources for Unit 2 in the event of a station blackout on Unit 2.

The two new diesel generators will each be provided with new cooling water (radiator cooled), lube oil, fuel storage and transfer, ventilation and starting air systems. These auxiliary systems are all located in the new D5/D6 Building. The Unit 2 diesel fuel oil storage tanks will be installed in underground vaults adjacent to the new building.

D5/D6 Diesel Generator Building Addition

A new Seismic Category I D5/D6 Diesel Generator Building has been constructed to house the two new diesel generators and auxiliary systems, including the Unit 2 safeguards buses. The building is located adjacent to the west end of the Auxiliary Building and the south side of the Turbine Building. The new building is a free standing structure with no structural connection to the existing plant.

Electrical Safeguards Upgrade

The upgraded safeguards auxiliary power system includes new 4kV and 480V buses for each Unit 2 safeguards train. One new 4kV bus per train (two total) and two new 480V buses per train (four total) will be located in the new D5/D6 Building. The undervoltage protection scheme for the new 4kV buses will meet Branch Technical Position PSB-1. Two new qualified solid state programmable logic controller-based load sequencer systems will be installed for Unit 2.

The existing Unit 1 4kV buses will be extended for additional capacity. The existing Unit 1 480V buses will be replaced by two new 480V buses per safeguards train (four total). Replacement of the Unit 1 480 V safeguards buses is scheduled for a later Unit 1 outage and will be the subject of a separate License Amendment Request. The undervoltage protection scheme for the extended 4kV buses will meet Branch Technical Position PSB-1. Two new qualified solid state programmable logic controller-based load sequencer systems will be installed for Unit 1.

The 480V safeguards buses in Unit 2 will be provided with automatic voltage regulation. Similar voltage regulation for Unit 1 480V safeguards buses will be provided when the Unit 1 480V buses are replaced.

Manual bus ties will be provided between the 4kV buses of the same train for the two units (e.g., between Unit 1 Train A and Unit 2 Train A) to provide an alternate AC power source during a station blackout event.

The 4kV safeguards buses in both units will be provided with direct connections to an "R" source transformer and to a Cooling Tower source transformer. This configuration will provide two immediate access independent offsite sources (i.e., a preferred and an alternate offsite source) to each 4kV safeguards bus.

Plant Interface

Cable connections between the new D5/D6 Building and the existing plant will be installed under the plant interface scope. Cables will be routed through new and existing raceways. All cable runs in the existing plant will meet the requirements of the Prairie Island USAR as a minimum.

Upgrade of #121 Cooling Water Pump

The existing vertical motor-driven cooling water pump will be upgraded to safeguards classification under this modification. Power connection capability will be provided to both trains of Unit 2 4kV buses through a new 4kV Bus 27 which will be capable of manual alignment to either one or the other train. The cables to #121 cooling water pump will be routed separately from either of the existing separation trains. The pump will receive an automatic start signal upon initiation of Safety Injection logic in either train of either unit. If both diesel-driven safeguards cooling water pumps come up to speed, #121 cooling water pump will trip; otherwise it will continue to run.

The design of the upgraded auxiliary power systems also meets the requirements of the Station Blackout Rule, 10 CFR Part 50, Section 50.63, by providing alternate AC power supply to the blacked-out unit through use of an operating emergency diesel generator on the non-blackout unit. Conformance with 10 CFR Part 50, Section 50.63, is the subject of a separate NSP submittal (Reference 3). The NRC responded to NSP's station blackout submittal in a Safety Evaluation Report (SER) dated September 18, 1990 (Reference 4). In the SER cover letter, the NRC staff stated:

> The Technical Specifications (TSs) for SBO should be consistent with the Interim Commission Policy Statement. The staff has taken the position that TSs are required for SBO equipment. However the question of how specification for the SBO equipment will be applied, is currently being considered generically under the technical specification improvement program and remains an open item at this time.
>
> In the interim you are expected to prepare and maintain adequate procedures to reflect the appropriate testing and surveillance requirements to ensure the operability of the SBO equipment.

Therefore, Technical Specifications on the alternate AC power bus ties are not included in this submittal but will be included in a later submittal, if necessary.

The related Technical Specifications changes justified by the attached Safety Evaluation and Determination of Significant Hazards Considerations are consistent with the design presented in the Design Report (References 1 and 2) as supplemented by our responses to NRC's requests for additional information (References 5, 6, 7, 8, 9). A safety evaluation has been performed including an analysis to assure that no single failure concerns have been introduced by the proposed changes.

The proposed Technical Specification changes have been categorized as either:

(1) Auxiliary Electrical Systems changes, or
(2) Cooling Water System changes.

REFERENCES:

(1) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated November 27, 1990 titled: "Design Report for the Station Blackout/Electrical Safeguards Upgrade Project"

(2) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated December 23, 1991 titled: "Design Report for the Station Blackout/Electrical Safeguards Upgrade Project, Revision 1 (TAC Nos. 68588 and 68589)"

(3) Letter from David Musolf, Northern States Power Company to Director, Nuclear Reactor Regulation, U S NRC dated April 13, 1989 titled: "Loss of All Alternating Current Power Information Required by 10 CFR Part 50, Section 50.63(c)(1)"

(4) Letter from Dominic C. DiIanni, Project Manager, Nuclear Reactor Regulation, U S NRC to T M Parker, Northern States Power Company dated September 18, 1990 titled: "Safety Evaluation of the Prairie Island Nuclear Generating Plant Unit Nos. 1 and 2; Station Blackout Rule 10 CFR 50.63 (TAC Nos. 68588 and 68589)"

(5) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated March 20, 1991 titled: "Reply to Questions on Design Report for the Station Blackout/Electrical Safeguards Upgrade Project (TAC Nos. 68588 and 68589)"

(6) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated April 16, 1991 titled: "Reply to Questions on Design Report for the Station Blackout/Electrical Safeguards Upgrade Project (TAC Nos. 68588 and 68589)"

(7) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated July 10, 1991 titled: "Reply to Questions on

Design Report for the Station Blackout/Electrical Safeguards Upgrade Project (TAC Nos. 68588 and 68589)"

(8) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated October 24, 1991 titled: "Supplemental Information on Programmable Logic Controllers for the Station Blackout/Electrical Safeguards Upgrade Project (TAC Nos. 68588 and 68589)"

(9) Letter from Thomas M Parker, Northern States Power Company to U S Nuclear Regulatory Commission dated January 8, 1992 titled "Reply to Questions on Design Report for the Station Blackout/Electrical Safeguards Upgrade Project (TAC Nos. M80659/80660)"

PROPOSED TECHNICAL SPECIFICATION CHANGES

1. Auxiliary Electrical Systems

a. Technical Specifications 3.7 and Tables TS.3.5-1 & TS.3.5-6
Technical Specifications Bases 3.5 and 3.7

Proposed Changes

Emergency Diesel Generators

Revise specifications 3.7.A, 3.7.B and specification basis 3.7 to reflect the new configuration for:

(1) addition of two new emergency diesel generators; and
(2) the Unit 1/Unit 2 emergency diesel generator arrangement.

Revise specification 3.7.A.5 and specification basis 3.7 to reflect the new Unit 2 minimum diesel fuel oil supply. The proposed change specifies a minimum fuel oil volume of 75,000 gallons be maintained for emergency diesel generators D5 and D6 in the Unit 2 interconnected diesel fuel oil storage tanks.

Revise specification 3.7.A.5 and specification basis 3.7 to clarify that a fuel supply of 51,000 gallons be maintained for emergency diesel generators D1 and D2 in the Unit 1 interconnected diesel fuel oil storage tanks. In addition, clarify that a total fuel supply of 70,000 gallons be maintained for D1 and D2 diesel generators and the diesel-driven cooling water pumps in the Unit 1 interconnected diesel fuel oil storage tanks.

Electrical Safeguards Upgrades

Revise specifications 3.7.A.1 and 3.7.B.1, 3.7.B.2, 3.7.B.3, 3.7.B.4 and 3.7.B.5 to clarify that the two separate paths from the transmission grid are to the unit safeguards distribution systems. Revise specifications 3.7.A.3 and 3.7.B.6 to reflect the new configuration for the Unit 2 480V safeguards bus arrangement.

Engineered Safety Features Instrumentation

Revise specification Tables TS.3.5-1 and TS.3.5-6 to reflect engineered safety features instrumentation limiting setpoints and instrument operating conditions for modified 4kV safeguards electrical buses. Revise Table TS.3.5-1 to reflect Unit 1 and Unit 2 limiting setpoints for undervoltage protection on 4kV safeguards buses. New setpoints are proposed to reflect replacement of degraded voltage and undervoltage relays. A new note is added to Table TS.3.5-1 to state that, "** Limiting setpoints are provided for both Unit 1 and Unit 2 in the interim between completion of electrical safeguards upgrades for Unit 2 and later completion of

electrical safeguards upgrades for Unit 1." Revise Table TS.3.5-6 to reflect the instrument operating conditions for the degraded voltage and undervoltage relays on each 4kV safeguards bus.

Revise specification basis 3.5 to add a statement that, "Relays are not provided on 4kV safeguards bus 27 to detect undervoltage and degraded voltage since voltage is monitored on the 4kV source safeguards bus (i.e., bus 25 or bus 26) to which it is connected."

Revise specification basis 3.5 to describe upgrades to undervoltage and degraded voltage protection for the 4kV safeguards buses and to provide the basis for setpoints and time delays selected.

Reasons for the Proposed Changes

Emergency Diesel Generators

Specification 3.7 and specification basis 3.7 currently reflect the plant configuration where two emergency diesel generators, D1 and D2, are shared by Prairie Island Nuclear Generating Plant, Units 1 and 2. Auxiliary Electrical Systems at Prairie Island Nuclear Generating Plant are being modified to add two new emergency diesel generators, D5 and D6; and to dedicate the two existing emergency diesel generators, D1 and D2, to Unit 1 and the two new emergency diesel generators, D5 and D6, to Unit 2.

Proposed changes to specification 3.7.A.5 and to specification basis 3.7 also reflect the dedication of the existing fuel storage and supply capability to Unit 1 emergency diesel generators and shared diesel-driven cooling water pumps, and the addition of a dedicated Unit 2 emergency diesel generator fuel storage and supply capability. These changes also reflect minimum volumes of fuel oil necessary for: (1) operation of one Unit 2 emergency diesel generator set for 7 days at rated load, and (2) operation of one Unit 2 emergency diesel generator set for 14 days to assure an adequate fuel oil supply in the event of the probable maximum flood. A volume of 75,000 gallons, which conservatively envelopes the two volumes calculated, was chosen for specification 3.7.A.5 as the minimum onsite diesel fuel oil supply for Unit 2.

Proposed changes to specification 3.7.A.5 and specification basis 3.7 reflect a clarification of the Unit 1 fuel oil requirement. The total requirement of 70,000 gallons for D1 and D2 diesel generators and the diesel-driven cooling water pumps remains unchanged. We have clarified the specification to indicate that 51,000 gallons of the 70,000 gallon total requirement for Unit 1 is available for D1 and D2 diesel generators. The 51,000 gallon requirement is sufficient to meet the 14 day requirement of diesel fuel oil for the D1 and D2 diesel generators as stated in specification basis 3.7.

We have chosen not to propose a change to specification 3.7.B.1 regarding the allowed out-of-service time for one diesel generator because our evaluation shows that the current limit of 7 days is justifiable. The new configuration will provide several features which are significant enhancements to the existing configuration:

(a) The arrangement of the offsite AC sources to the safeguards buses will have been improved to reduce the risk of losing offsite AC power to the safeguards buses.

(b) The onsite AC power system will be enhanced considerably in that a loss-of-offsite-power event coupled with the loss of a diesel generator will be mitigated by the availability of another diesel generator which can be cross-tied to the affected 4160 volt safeguards bus.

(c) The D5 and D6 diesel generators will provide a diverse means of providing power to the 4160 volt safeguards buses, in addition to simply adding redundancy. With respect to the existing D1 and D2 diesels, D5 and D6 were made by a different manufacturer, have different cooling systems, different size ratings and will be housed in a separate building located on the opposite side of the plant. These factors reduce many of the common failure mechanisms that could otherwise affect all the diesel generators.

In addition, the D5 and D6 diesel engines will be cooled using radiators instead of being reliant on a separate cooling water system.

(d) The reliability of the existing D1 and D2 diesel generators, which require a separate cooling water system, will also be enhanced. Currently, two diesel-driven cooling water pumps are available following a loss-of-offsite-power event. After completion of the SBO/ESU Project modifications, an additional motor-driven cooling water pump will be available, powered from the Unit 2 safeguards buses.

All of these enhancements greatly reduce the risk of having a station blackout event at Prairie Island. Prior to submittal of the Prairie Island Individual Plant Examination (IPE), an interim plant-specific risk assessment has been developed, based on the PWR Individual Plant Evaluation Methodology (IPEM). This study shows that the addition of the D5 and D6 diesel generators and repowering of the motor-driven cooling water pump from a safeguards power supply greatly reduces the risk of a core melt accident due to station blackout. The IPE study results indicate a core damage frequency (CDF) for each unit of slightly less than 1.0E-5/year. This figure is lower than the PRA results of many other plants, and is due in large part to the increased reliability of the AC power systems offered by the SBO/ESU Project modifications.

A sensitivity study on the Prairie Island IPEM analysis, following the approach of NUREG/CR-5742, "Feasibility Assessment of a Risk-Based Approach to Technical Specifications", was performed. This sensitivity study generated a hypothetical allowed out-of-service time for one diesel generator of approximately 300 hours (see Figure 1) as opposed to the current specification of 7 days (168 hours). This contrasts with the two reference plants reported in the NUREG: the analysis for the first plant yielded a real time risk-based allowed out-of-service time of 12 hours versus its technical specification limit of 168 hours; the analysis for the second plant yielded a real time risk-based allowed out-of-service time of 31 hours versus its technical specification limit of 168 hours.

The NUREG calculation compares the increase in core damage frequency due to equipment outage to an acceptable limit (5.0E-7). Since Prairie Island starts with a relatively low CDF, the change in CDF due to a particular component or components being out of service will be less than at other plants.

Due to the enhancements listed in (a) through (d) above, and to the increase in the calculated risk-based allowed out-of-service time afforded by the enhancements, we believe that the existing emergency diesel allowed out-of-service time is justifiable for the new onsite AC power system. Therefore, we do not propose to decrease the allowed out-of-service time for a diesel generator to less than 7 days.

Electrical Safeguards Upgrades

In addition, 4kV and 480V safeguards electrical buses and bus arrangements are being modified. Unit 2 480V safeguards buses are being replaced. Replacement of Unit 1 480V safeguards buses will be implemented at a later date; therefore, changes reflected in specifications 3.7.A.3 and 3.7.B.6 reflect only the Unit 2 480V safeguards bus replacement. Additional Technical Specifications changes will be requested to coincide with completion of 480V bus replacement for Unit 1.

We have taken this opportunity to make changes to specifications 3.7.A.1, 3.7.B.1, 3.7.B.2, 3.7.B.3, 3.7.B.4 and 3.7.B.5 to clarify that the two separate paths from the transmission grid are to the unit safeguards distribution systems.

Engineered Safety Features Instrumentation

Proposed changes to Tables TS.3.5-1 and TS.3.5-6 reflect upgrades of the undervoltage protection scheme per NRC Branch Technical Position PSB-1. A separate Technical Specifications change will be requested to revise Table TS.3.5-1 to coincide with completion of 480V safeguards bus replacement for Unit 1.

Changes to specification basis 3.5 have been proposed to state that no undervoltage monitoring is provided for 4kV safeguards bus 27 since this bus will be supplied from either 4kV source safeguards bus 25 or 26 which are monitored for undervoltage conditions. This lineup for bus 27 will provide the safeguards source for the upgraded vertical motor-driven cooling water pump.

Changes to specification basis 3.5 have been proposed to describe upgrades to undervoltage and degraded voltage protection for the 4kV safeguards buses and to provide the basis for setpoints and time delays selected.

Safety Evaluation and Determination of Significant Hazards Considerations

The proposed changes to the Operating Licenses have been evaluated to determine whether they constitute a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   SBO/ESU Project modifications as reflected in the proposed Technical Specifications changes were evaluated to determine their impact, if any, on potential transients and accidents as described in the Prairie Island USAR. Each transient and accident was evaluated in terms of the mitigating actions described or assumed in the USAR analysis. The role of the modified systems in mitigating the event was analyzed in order to evaluate whether the modification:

   (1) changed, degraded or prevented actions described or assumed in the USAR analysis;
   (2) altered any assumptions made in evaluating the radiological consequences of the accident;
   (3) played a direct part in mitigating the radiological consequences of the accident; or
   (4) affected any fission product barrier.

   The evaluation demonstrated that the USAR transient and accident analyses remain valid and bounding.

   As part of the evaluation, the revised emergency diesel generator load sequence was analyzed and found to be bounded by the existing analyses.

   In particular, the USAR analyses of the loss of offsite power (LOOP) event and the large break loss of coolant accident (LBLOCA) remain valid and bounding. In addition, the current USAR analysis for the radiological consequences of a LBLOCA remains valid.

Further, the plant response to a loss of AC power event is not degraded as a result of these changes but, in fact, is significantly improved.

In order to determine the effect of the modifications upon the probability and consequences of an accident, the following items were specifically evaluated:

(1) the applicable design, material and construction standards;
(2) instrumentation accuracies and response times;
(3) the equipment operating and design limits, including electrical bus loading, emergency diesel generator loading and battery loading;
(4) the system interfaces;
(5) voltage margins; and
(6) coordination of protective devices.

Structures, systems and components involved in the modifications reflected in the proposed Technical Specifications changes were evaluated as follows:

(1) The design specifications for the new structures, systems and components were considered for the following requirements:
-seismic;
-separation including control/power circuit interaction, redundancy/separation of systems, and isolation between safety and non-safety circuits;
-environmental parameters;
-severe meteorological events;
-missiles; and
-fire protection.
All structures, systems and components meet the appropriate design requirements for their respective classifications.

(2) Structures, systems and components were additionally evaluated for the following:
-Structural loads were determined for new cable runs in the existing plant and for new cable penetrations in the existing structures.
-New electrical loads requirements were determined.
-System/equipment protection features have been maintained in the modification.
-Support system performance was specified to maintain the safety function of the equipment.
-System/equipment redundancy and independence is maintained.
-The frequency of operation of existing equipment was evaluated and determined not to be affected.
-The testing requirements imposed on new structures, systems and components are in accordance with their safety classification.

Failures of systems and components involved in the modifications were analyzed, and it was determined that all safety functions were maintained.

The selected diesel generator supplier (Société Alsacienne de Constructions Mécaniques de Mulhouse of France) was chosen largely based on the very high reliability of their diesel generator sets in nuclear plants around the world. Details regarding their reliability are included in a previous submittal: Letter from Thomas M Parker, Northern States Power Company to Director of Nuclear Reactor Regulation, U S NRC dated September 29, 1989 titled: "Project for Addition of Two Emergency Diesel Generators."

In addition, as discussed on pages 8 and 9, a plant specific risk analysis has been performed on the modified plant configuration. The results of this analysis indicate a risk reduction of approximately 70% in total core damage frequency by the addition of the new emergency diesel generators and the upgrade of #121 cooling water pump.

Emergency Diesel Generators

The plant auxiliary electrical systems modifications provide a greater degree of power source availability for the Prairie Island Nuclear Generating Plant. As demonstrated by the performance of a failure modes and effects analysis, no single failure will prevent the modified plant from performing its required safety function in the event of an accident on either unit.

The minimum diesel fuel supply of 75,000 gallons in specification 3.7.A.5 for Prairie Island Unit 2 is based on using the time dependent method of ANSI N195-1976 to calculate the minimum diesel fuel supply necessary to supply one Unit 2 emergency diesel generator set for 14 days to assure a fuel supply in the event of a probable maximum flood. The conservative method of ANSI N195-1976 was used to calculate the minimum diesel fuel supply necessary to supply one Unit 2 emergency diesel generator set for seven days at rated load of 5400kW, which is significantly above the maximum predicted load for a Unit 2 emergency diesel generator. The calculated minimum volume for seven day operation of one Unit 2 emergency diesel generator set using the conservative method of calculation was less than the minimum volume necessary for 14 day operation calculated using the time dependent method. A conservative volume is proposed in specification 3.7.A.5 as the required minimum fuel supply for Unit 2 emergency diesel generators. This minimum volume envelopes the 7 day and the 14 day requirements.

The clarification of specification 3.7.A.5 to state the 51,000 gallon diesel fuel oil requirement for emergency diesel generators D1 and D2 and to restate the total Unit 1 diesel fuel oil supply requirement of 70,000 gallons for the D1 and D2 diesel generators and the diesel-driven cooling water pumps is considered an administrative change. This change is considered administrative in that it does not reflect any change to the physical plant or any change to the operation of the plant and as such is not considered to affect the probability or consequences of an accident previously evaluated.

Electrical Safeguards Upgrades

Required engineered safeguards features loads are accommodated with the improved auxiliary electrical systems configuration; and, as demonstrated by the performance of a failure modes and affects analysis, no single failure will prevent the modified plant from performing its required safety function in the event of an accident on either unit.

Specifications 3.7.A.1, 3.7.B.1, 3.7.B.2, 3.7.B.3, 3.7.B.4 and 3.7.B.5 are being revised to clarify that the two separate paths from the transmission grid are to the unit rather than plant safeguards distribution system. This change is considered administrative in that it does not reflect any change to the physical plant or any change to the operation of the plant and as such is not considered to affect the probability or consequences of an accident previously evaluated.

Engineered Safety Features Instrumentation

Changes to Table TS.3.5-1 reflect new setpoints for 4kV safeguards bus degraded voltage and undervoltage relays. Instrument operating conditions for these relays are reflected on revised Table TS.3.5-6.

The new setpoints and respective time delays have been established based on the guidance in NRC Branch Technical Position PSB-1, "Adequacy of Station Electric Distribution System Voltages," dated July 1981. The undervoltage protection scheme reflected in these proposed changes provides for detection of undervoltage and degraded voltage conditions at the 4kV safeguards bus level.

Upon receipt of an undervoltage signal, the automatic voltage restoring scheme is actuated after a short time delay. This time delay prevents actuation during normal transients (such as motor starting) and allows protective relaying operation during faults.

The degraded voltage scheme provides two separate time delays. Per Branch Technical Position PSB-1, these time delays are selected as follows:

(1) The first time delay was selected to establish the existence of a sustained degraded voltage condition, i.e., a duration greater than the longest expected voltage dip resulting from Class 1E motor starting.

(2) The second time delay was established in a range limited so that permanently connected Class 1E loads would not be damaged.

When degraded voltage is sensed, two time delays are actuated. Logic actuation following the first time delay annunciates that a sustained degraded voltage condition exists and enables logic which will ensure that voltage and timing are adequate for safety injection loads by automatically performing the following upon receipt of a safety injection signal:

(1) Auto start the diesel generator;
(2) Separate the bus from the grid;
(3) Load the bus onto the diesel generator; and
(4) Start the load sequencer (including safety injection loads).

The second longer time delay is used to allow the degraded voltage condition to be corrected by external actions within a time period that will not cause damage to operating equipment. If voltage is not restored within that time period, the logic automatically performs the following:

(1) Auto start the diesel generator;
(2) Separate the bus from the grid;
(3) Load the bus onto the diesel generator; and
(4) Start the load sequencer.

For the reasons discussed above, the proposed amendment does not significantly increase the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or <u>different kind of accident from any accident previously evaluated.</u>

The SBO/ESU Project modifications as reflected in the proposed Technical Specifications changes were evaluated to determine if they could create the possibility of a new or different kind of accident from any accident previously evaluated.

The modifications were evaluated to determine the types of accidents which could result from malfunction of the new/modified structures, systems and components. It was determined that no new or different kinds of accidents from those previously evaluated are created. USAR analyses remain bounding.

Emergency Diesel Generators

The modifications as reflected in the proposed Technical Specifications changes were evaluated to determine types of failure modes which were not previously evaluated. As a result, the following was determined:

(1) Radiator cooling for the new Unit 2 diesel generators is provided instead of the heat exchanger cooling utilized for the existing diesels. It has been determined that these radiators can perform their safety function.

(2) The new load sequencers for the safeguards buses are programmable solid state devices. These devices will have validation and verification performed for the logic and will be tested to ensure that they are capable of performing their safety function in the plant electromagnetic/radio environment.

The clarification of specification 3.7.A.5 to state the 51,000 gallon diesel fuel oil requirement for emergency diesel generators D1 and D2 and to restate the total Unit 1 diesel fuel oil supply requirement of 70,000 gallons for the D1 and D2 diesel generators and the diesel-driven cooling water pumps is considered an administrative change and as such does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Electrical Safeguards Upgrades

The modifications as reflected in the proposed Technical Specifications changes were evaluated to determine types of failure modes which were not previously evaluated. It was determined that the new 480V safeguards buses will be provided with voltage regulators which employ programmable solid state control devices. The postulated failure modes of the voltage regulator include overvoltage and undervoltage conditions outside the operating range of the equipment powered by the bus. The effects of such failures are bounded by the complete loss of a safeguards train, which is postulated in the current plant design.

Changes to specifications 3.7.A.1, 3.7.B.1, 3.7.B.2, 3.7.B.3, 3.7.B.4 and 3.7.B.5 which clarify that the two separate paths from the transmission grid are to the unit rather than plant safeguards distribution system are considered administrative and as such do not create the possibility of a new or different kind of accident from any accident previously evaluated.

Engineered Safety Features Instrumentation

The proposed changes to Tables TS.3.5-1 and TS.3.5-6 do not introduce any basic changes in plant operation. The ability to detect and protect against 4kV safeguards bus undervoltage conditions is maintained for the new auxiliary electrical systems configuration.

For the reasons discussed above, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

Emergency Diesel Generators

The auxiliary electrical system for each unit has the capacity to start and operate sufficient safeguards equipment to maintain adequate cooling of the fuel and to maintain containment pressure within design limits in the event of a LOCA. The new Unit 2 emergency diesel generators were sized to meet this requirement, to provide capacity to power the vertical motor-driven safeguards cooling water pump and to provide additional margin for future loads.

The new Unit 2 diesel fuel oil storage tanks provide sufficient capacity to supply both emergency diesel generators for seven days at rated load. As stated above, the minimum fuel oil supply of 75,000 gallons will supply one Unit 2 emergency diesel generator set for seven days at a rated load of 5400kW, which is significantly above the maximum predicted load for a Unit 2 emergency diesel generator set. Further, this minimum fuel oil supply of 75,000 gallons will supply one Unit 2 emergency diesel generator set for 14 days at a load calculated per the time dependent method of ANSI N195-1976.

These changes improve the margin of safety for each unit and improve the overall margin of safety for the Prairie Island Nuclear Generating Plant by providing increased onsite AC power availability, by dedicating two emergency diesel generators to each unit and by providing two emergency diesel generators that are not dependent on the cooling water system.

The clarification of specification 3.7.A.5 to state the 51,000 gallon diesel fuel oil requirement for emergency diesel generators D1 and D2 and to restate the total Unit 1 diesel fuel oil supply requirement of 70,000 gallons for the D1 and D2 diesel generators and the diesel-driven cooling water pumps is considered an administrative change and as such does not affect the margin of safety.

Electrical Safeguards Upgrades

The new Unit 2 480V safeguards configuration accomplishes the following:

(1) provides additional circuit breakers for improved MCC feeder circuit coordination by eliminating subfed 480V MCCs from safeguards 480V buses; and
(2) improves voltage regulation at the 480V level.

Changes to specifications 3.7.A.1, 3.7.B.1, 3.7.B.2, 3.7.B.3, 3.7.B.4 and 3.7.B.5 which clarify that the two separate paths from the transmission grid are to the unit rather than plant safeguards distribution system are considered administrative and as such do not affect the margin of safety.

Engineered Safety Features Instrumentation

In determining the revised 4kV safeguards bus undervoltage and degraded voltage protection setpoints for Table TS.3.5-1, criteria and equipment voltage requirement assumptions used in the calculation of the new setpoints were essentially the same as those used to calculate the existing setpoints.

The degraded voltage protection setpoint remains at 90 ± 2% of nominal 4160V safeguards bus voltage for Unit 1. A separate License Amendment Request will be provided to revise this setpoint to coincide with later replacement of the 480V safeguards buses. The degraded voltage protection setpoint selected for Unit 2 is 87.5 ± 3.5% of nominal 4160V safeguards bus voltage. Testing and analysis have shown that all safeguards loads will operate properly at or above the minimum degraded voltage setpoint. The maximum degraded voltage setpoint is chosen to prevent unnecessary actuation of the voltage restoring scheme at the minimum expected grid voltage. The first degraded voltage time delay of 8 ± 0.5 seconds has been shown by testing and analysis to be long enough to allow for normal transients (i.e., motor starting and fault clearing). It is also longer than the time delay required to start the safety injection pump at minimum voltage. The second degraded voltage time delay is provided to allow the degraded voltage condition to be corrected within a time frame which will not cause damage to permanently connected equipment.

The undervoltage setpoint is 75 ± 2.5% of nominal bus voltage. The minimum setpoint ensures equipment operates above the limiting value of 75% (of 4000V) for one minute operation. The 75% maximum setpoint is chosen to prevent unnecessary actuation of the voltage restoring scheme during voltage dips which occur during motor starting. The undervoltage time delay of 4 ± 1.5 seconds has been shown by testing and analysis to be long enough to allow for normal transients and short enough to

operate prior to the degraded voltage logic, providing a rapid transfer to an alternate source.

The existing margin of safety has been maintained by the proposed setpoints and time delays for 4kV safeguards bus undervoltage and degraded voltage protection.

For the reasons discussed above, the proposed amendment does not involve a significant reduction in the margin of safety.

Based on the evaluation described above, and pursuant to 10 CFR Part 50, Section 50.91, Northern States Power Company has determined that operation of the Prairie Island Nuclear Generating Plant in accordance with the proposed License Amendment Request does not involve any significant hazards considerations as defined by NRC regulations in 10 CFR Part 50, Section 50.92.

b. Technical Specification 4.6
Technical Specification Basis 4.6

Proposed Changes

Revise specification 4.6.A.1.c to reference ASTM D975-77, "Standard Specification for Diesel Fuel Oils," rather than the 1968 version, for specification of acceptable diesel fuel oil limits.

Revise specification 4.6.A.1.e to add monthly surveillance tests for the new Unit 2 emergency diesel generators, D5 and D6.

Revise specification 4.6.A.2.c to add semi-annual surveillance tests for the new Unit 2 emergency diesel generators.

Revise specification 4.6.A.3.b.3 to add 18 month surveillances to verify that auto-connected loads do not exceed the tested capacity of the new Unit 2 emergency diesel generators.

Revise specification 4.6.A.3.c to add 18 month surveillance tests for the new Unit 2 emergency diesel generators.

Revise specification 4.6.A.3.d to add 18 month surveillances to verify the capability of each of the new Unit 2 emergency diesel generators to reject the single largest emergency load without tripping.

Revise specification basis 4.6 to specifically state that the load rejection test will demonstrate the capability of each emergency diesel generator to reject the single largest emergency load without tripping.

Revise specification basis 4.6 to reflect the new emergency diesel generator configuration of two emergency diesel generators per unit.

Revise 4.6.A.1.e and 4.6.A.2.a to remove the specific engine speed which is the "synchronous speed" for these surveillances.

Revise 4.6.A.1.e and 4.6.A.3.b.2 to correct spelling errors.

Reasons for the Proposed Changes

Specification 4.6.A.1.c currently reflects the monthly surveillances for diesel generator fuel oil sampling. This specification has been revised to reflect use of the 1977 version of ASTM D975 for specification of acceptable diesel fuel oil limits as recommended by NRC Regulatory Guide 1.137, Revision 1.

Specification 4.6.A.1.e currently reflects monthly surveillances for emergency diesel generators D1 and D2. This specification has been revised to reflect monthly surveillances for new Unit 2 emergency diesel generators D5 and D6.

Specification 4.6.A.2.c currently reflects semi-annual surveillance tests for emergency diesel generators D1 and D2. This specification has been revised to reflect semi-annual surveillance tests for the new Unit 2 emergency diesel generators D5 and D6.

Specification 4.6.A.3.b.3 currently reflects the 18 month surveillances to verify auto-connected loads for emergency diesel generators D1 and D2. This specification has been revised to reflect the 18 month surveillances to verify that the auto-connected loads for emergency diesel generators D5 and D6 do not exceed the tested capacity of the new Unit 2 emergency diesel generators.

Specification 4.6.A.3.c currently reflects 18 month surveillance tests for emergency diesel generators D1 and D2. This specification has been revised to reflect 18 month surveillance tests for emergency diesel generators D5 and D6.

Specification 4.6.A.3.d currently reflects the 18 month surveillances to verify the capability of emergency diesel generators D1 and D2 to reject the largest single emergency load without tripping. This specification has been revised to reflect the largest single emergency load for surveillance testing of the new Unit 2 emergency diesel generators D5 and D6.

Finally, we have taken this opportunity to make certain minor administrative changes to specification 4.6 to correct spelling errors and to clarify the specification. The clarification is made in specifications 4.6.A.1.e and 4.6.A.2.a to remove the specific engine speed which is the "synchronous speed."

Safety Evaluation and Determination of Significant Hazards Considerations

The proposed changes to the Operating Licenses have been evaluated to determine whether they constitute a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   Emergency diesel generators are required to have sufficient capacity and capability to ensure that acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences. Further, emergency diesel generators are required to have sufficient capacity and capability to ensure that the core is cooled and that containment integrity and other vital functions are maintained in the event of postulated accidents.

Emergency diesel generator testing and surveillance demonstrate during monthly, semi-annual and 18 month tests and surveillances that the emergency diesel generators are capable of performing their design safety function. Diesel fuel oil quality is determined by monthly surveillance sampling.

Tests and surveillances for new emergency diesel generators D5 and D6 will be performed at the same frequency as current specification 4.6 tests and surveillances for emergency diesel generators D1 and D2. Equivalent testing requirements will be maintained for emergency diesel generators D5 and D6.

Proposed revisions to the following specifications are considered administrative and as such are not considered to affect the probability or consequences of an accident previously evaluated:

(1) specifications 4.6.A.1.e and 4.6.A.2.a to remove the specific engine speed which is the "synchronous speed"; and

(2) specifications 4.6.A.1.e and 4.6.A.3.b.2 to correct spelling errors.

For the reasons discussed above, the proposed amendment does not significantly increase the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

Testing and surveillances proposed by these specification changes do not constitute new modes of operation for emergency diesel generators since the testing and surveillances proposed for Unit 2 emergency diesel generators D5 and D6 are equivalent in type and frequency to those performed for emergency diesel generators D1 and D2.

Administrative changes described in 1. above are not considered to create the possibility of a new or different kind of accident from any accident previously evaluated.

For the reasons discussed above, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

Monthly surveillances of fuel oil quality will provide assurance that stored fuel oil maintains necessary quality limits. Use of fuel oil quality acceptance limits of ASTM D975-77 will not decrease the margin of safety maintained by currently specified acceptance limits.

Testing and surveillance of Unit 2 emergency diesel generators D5 and D6 at the loads specified will provide assurance that the emergency diesel generators are capable of supplying their required safeguards loads, while remaining capable of supplying these loads for the length of the fuel cycle.

Proposed changes to specifications 4.6.A.1.e, 4.6.A.2.c and 4.6.A.3.c require monthly, semi-annual and 18 month surveillance testing for Unit 2 emergency diesel generators to assure that the emergency diesel generators have the capability to start, accelerate to synchronous speed and accept load.

The proposed monthly, semi-annual and 18 month surveillance tests in specifications 4.6.A.1.e, 4.6.A.2.c and 4.6.A.3.c involve loading each Unit 2 emergency diesel generator to between a minimum of 5100kW and a maximum of 5300kW. The minimum 5100kW test load has been chosen to assure that either Unit 2 emergency diesel generator has the capacity and the capability to assume the maximum auto-connected load for Unit 2. The maximum 5300kW test load has been chosen to provide a load test range for operational test flexibility during the surveillance test.

The minimum 5100kW test load in specifications 4.6.A.1.e, 4.6.A.2.c and 4.6.A.3.c also corresponds to the load proposed for the specification surveillance 4.6.A.3.b.3. It should be noted that, although 5100kW is not the continuous rating of the Unit 2 emergency diesel generators, it is significantly above the maximum auto-connected load. The current maximum auto-connected load is more than 1000 kW under the 5100kW minimum test load for the Unit 2 emergency diesel generators. Therefore, the proposed specification 4.6.A.3.b.3 requirement to verify that the auto-connected loads do not exceed 5100kW for each Unit 2 emergency diesel generator is quite conservative.

Finally, specification 4.6.A.3.d has been revised to state the surveillance test load for the Unit 2 emergency diesel generator load rejection test. The load rejection test will demonstrate the capability of each Unit 2 emergency diesel generator to reject the single largest emergency load (i.e., the vertical motor-driven safeguards cooling water pump) without tripping. A test load of at least 860kW will demonstrate this capability.

Administrative changes described in 1. above do not affect the margin of safety.

For the reasons discussed above, the proposed amendment does not involve a significant reduction in the margin of safety.

Based on the evaluation described above, and pursuant to 10 CFR Part 50, Section 50.91, Northern States Power Company has determined that operation of the Prairie Island Nuclear Generating Plant in accordance

with the proposed License Amendment Request does not involve any significant hazards considerations as defined by NRC regulations in 10 CFR Part 50, Section 50.92.

2. Cooling Water System

a. Technical Specification 3.3.D
Technical Specification Basis 3.3

Proposed Changes

Changes are being proposed to specification 3.3.D and specification basis 3.3 to reflect the availability of the upgraded vertical motor-driven (#121) cooling water pump as a safeguards cooling water pump which can be used as an equivalent replacement for either of the diesel-driven safeguards cooling water pumps.

Replace specifications 3.3.D.1.a and b with a new specification 3.3.D.1.a to require four of the five cooling water pumps to be OPERABLE. Specification 3.3.D.1.a, as proposed, requires that certain conditions be met if the inoperable cooling water pump is one of the diesel-driven safeguards cooling water pumps (i.e., when the upgraded vertical motor-driven cooling water pump is used as an equivalent replacement for one of the two diesel-driven safeguards cooling water pumps). If the inoperable cooling water pump is one of the diesel-driven cooling water pumps, then #121 cooling water pump shall be aligned as shown in the table below (see Figure 2). All changes in valve positions shall be under direct administrative control.

Inoperable Pump	Valve Alignment	Power Supply to Bus 27 (#121 Cooling Water Pump)
#12 Cooling Water Pump	MV-32037 or MV-32036 closed; and associated Bkr Locked Off	Bus 25
	MV-32034 and MV-32035 open; and both Bkrs Locked Off	
#22 Cooling Water Pump	MV-32034 or MV-32035 closed; and the associated Bkr Locked Off	Bus 26
	MV-32037 and MV-32036 open; and both Bkrs Locked Off	

Revise specification basis 3.3 to state that specification 3.3.D.1.a assures that an automatic safety injection signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train.

Revise specification basis 3.3 to state that specification 3.3.D.1.a also assures that the vertical motor-driven (#121) cooling water pump is aligned to provide cooling water to the same train as the train from which it is powered.

Renumber specification 3.3.D.1.c as 3.3.D.1.b.

Add a new specification 3.3.D.1.c to clearly reflect the existing requirement for two cooling water headers to be OPERABLE.

Add a new specification 3.3.D.1.d to require the 19,000 gallon minimum fuel supply in the interconnected storage tanks for the diesel-driven cooling water pumps. Furtner, new specification 3.3.D.1.d notes that the 19,000 gallon requirement is included in the 70,000 gallon total diesel fuel oil requirement of specification 3.7.A.5 for Unit 1. Revise the specification and basis 3.3 to include this minimum fuel supply and to clarify that the 19,000 gallon requirement is included in the 70,000 gallon total onsite requirement of specification 3.7.A.5 for Unit 1.

Replace specifications 3.3.D.2.a and b with a revised specification 3.3.D.2.a to reflect a limiting condition for operation when two of the five cooling water pumps are inoperable. Specification 3.3.D.2.a, as proposed, requires that certain conditions be met if the two inoperable pumps are safeguards pumps (i.e., #12 cooling water pump, #22 cooling water pump, #121 cooling water pump). The conditions to be met are:

(1) the engineered safety features associated with the OPERABLE safeguards cooling water pump are OPERABLE; and

(2) both paths from the transmission grid to the unit 4KV safeguards buses are OPERABLE (applicable to Unit 1 operation only); and

(3) this condition of inoperability (i.e., two safeguards pumps inoperable simultaneously) may not exceed 7 days in any consecuti › 30 day period.

Renumber specifications 3.3.D.2.c, d, e and f as 3.3.D.2.b, c, d and e.

Revise specification basis 3.3 to reflect that cooling water can be supplied by either of two horizontal motor-driven cooling water pumps, by a safeguards motor-driven pump or by either of two safeguards diesel-driven pumps.

Reasons for the Proposed Changes

The vertical motor-driven cooling water pump is being upgraded so that is can be used as a safeguards cooling water pump. This vertical motor-driven safeguards cooling water pump will be an equivalent replacement for either of the two existing diesel-driven safeguards cooling water pumps. Changes to specification 3.3.D.1 and 3.3.D.2 have been proposed to reflect the availability of this third safeguards cooling water pump and to simplify the specifications.

Revised specification 3.3.D.1.a requires four of the five cooling water pumps to be OPERABLE. When it is necessary, this revised specification will allow any one of the five cooling water pumps to be out of service for maintenance without degrading the Technical Specification required cooling water system. The one out of five pumps may be a safeguards pump or a nonsafeguards pump.

Revised specification 3.3.D.1.a specifies additional requirements if the inoperable cooling water pump is one of the diesel-driven safeguards cooling water pumps. In that case, the following requirements are necessary so that the vertical motor-driven cooling water pump can be used as an equivalent replacement for the inoperable diesel-driven safeguards cooling water pump:

If the inoperable cooling water pump is one of the diesel-driven cooling water pumps, then #121 cooling water pump shall be aligned as shown in the table below. All changes in the valve positions shall be under direct administrative control.

Inoperable Pump	Valve Alignment	Power Supply to Bus 27 (#121 Cooling Water Pump)
#12 Cooling Water Pump	MV-32037 or MV-32036 closed; and associated Bkr Locked Off	Bus 25
	MV-32034 and MV-32035 open; and both Bkrs Locked Off	
#22 Cooling Water Pump	MV-32034 or MV-32035 closed; and the associated Bkr Locked Off	Bus 26
	MV-32037 and MV-32036 open; and both Bkrs Locked Off	

These proposed changes assure that the cooling water header isolation valves are properly aligned so that #121 cooling water pump functions as an equivalent replacement for the inoperable diesel-driven cooling water pump, thus maintaining redundant cooling water supply capability. These proposed changes assure that an automatic safety injeciton signal to the cooling water header isolation valves will not align both OPERABLE safeguards pumps to the same safeguards train. These proposed changes also assure that #121 cooling water pump is aligned to provide cooling water to the same train as the train from which it is powered.

New specification 3.3.D.1.c is added to clearly reflect the existing Technical Specifications requirement for two cooling water headers to be OPERABLE. This is not a new requirement since specification 3.3.D.2.c currently provides the limiting condition for operation with one of the two required cooling water headers inoperable.

Specification 3.3.D.1.d is being revised to specifically acknowledge the requirement for a minimum fuel supply of 19,000 gallons for diesel-driven cooling water pumps. Existing Technical Specifications include this minimum fuel supply as part of the 70,000 gallon total required by specification 3.7.A.5 for Unit 1. Based on the Technical Specifications changes proposed in this request, it is prudent to clarify this requirement by specifically adding it to specification 3.3.D. This is not a new requirement but is a clarification of the existing Technical Specifications requirement.

Revised specification 3.3.D.2.a reflects a limiting condition for operation when two of the five cooling water pumps are inoperable. Per the revised specification, two of the five cooling water pumps may be inoperable for 7 days, whether the pump is a safeguards pump or a nonsafeguards pump.

Revision to specification 3.3.D.2.a.(1) reflects deletion of what was a confusing reference to the "associated diesel generator." The Technical Specifications definition of the term "OPERABLE" states in part:

> A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing their related support function(s).

In revised specification 3.3.D.2.a.(1), the implicit assumption is that an emergency power source associated with the OPERABLE safeguards cooling water pump is available (i.e., the appropriate Unit 2 emergency diesel generator is available to power the vertical motor-driven safeguards cooling water pump). And when this specification requires engineered safety features associated with the operable safeguards cooling water pump, it is an implicit assumption that the engineered safety features (and their associated emergency diesel generator) associated with the OPERABLE safeguards cooling water pump are OPERABLE. As an example, if the vertical motor-driven safeguards cooling water pump was the remaining safeguards cooling water pump under specification 3.3.D.2.a, then revised specification 3.3.D.2.a.(1) would require:

(1) vertical motor-driven safeguards cooling water pump (aligned to one train of engineered safety features) and the associated Unit 2 emergency diesel generator; and
(2) engineered safety features associated with the OPERABLE safeguards cooling water pump and the Unit 1 or Unit 2 emergency diesel generator associated with the OPERABLE engineered safety features train on Unit 1 or Unit 2, respectively.

Specification 3.3.D.2.a is being revised in specification 3.3.D.2.a.(2) to specifically apply to Unit 1 since diesel generators D1 and D2, which require cooling water system flow, are being dedicated to Unit 1. Unit 2 diesel generators D5 and D6 do not require cooling water system support and, therefore, loss of redundancy in the cooling water system does not degrade the Unit 2 onsite emergency AC power system.

We have also taken this opportunity to make a change in revised specification 3.3.D.2.a.(2) to clarify that both paths from the transmission grid are to the unit rather than plant 4kV safeguards buses.

Revised specification 3.3.D.2.a.(3) acknowledges the more restrictive condition of inoperability (i.e., two safeguards pumps inoperable simultaneously) and restricts this condition of inoperability so that it may not exceed 7 days in any consecutive 30 day period. This revised specification retains this restriction from the current specification 3.3.D.2.a.

For editorial reasons, specifications 3.3.D.2.d, e, f and g have been renumbered as 3.3.D.2.c, d, e and f.

Safety Evaluation and Determination of Significant Hazards Considerations

The proposed changes to the Operating Licenses have been evaluated to determine whether they constitute a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The existing vertical motor-driven cooling water pump and supporting systems are being upgraded to safeguards classification as part of the SBO/ESU Project. This upgrade as reflected in the proposed Technical Specifications changes was evaluated to determine its impact, if any, on potential transients and accidents as described in the Prairie Island Nuclear Generating Plant USAR. Each transient and accident was evaluated in terms of the mitigating actions described or assumed in the USAR analyses. The role of the upgraded systems and components in mitigating the event was analyzed to evaluate whether the upgrade:

   (1) changed, degraded or prevented actions described or assumed in the USAR analysis;
   (2) altered any assumptions made in evaluating the radiological consequences of the accident;
   (3) played a direct part in mitigating the radiological consequences of the accident; or

(4) affected any fission product barrier.

The evaluation demonstrated that the USAR transient and accident analyses remain bounding.

The proposed Technical Specifications changes to specification 3.3.D and specification basis 3.3 do not degrade the capability of the cooling water system to function as currently required by Technical Specifications. The upgrade of the vertical motor-driven cooling water pump and supporting systems/components provides a diverse means of satisfying the requirement for cooling water to engineered safety features equipment.

In order to determine the effect of the upgrade upon the probability of an accident, the following items were specifically evaluated:

(1) the applicable design, material and construction standards;
(2) instrumentation performance;
(3) the equipment operating and design limits, including net positive suction head (NPSH) requirements for the vertical motor-driven cooling water pump; and
(4) the system interfaces.

A detailed evaluation was performed to determine that the upgraded vertical motor-driven cooling water pump and its support systems/components can function as an independent, diverse means of providing cooling water to engineered safety features equipment. The following areas were specifically evaluated:

(1) seismic design and seismic qualification;
(2) separation, including control/power circuit interaction, redundancy/separation of systems, and isolation between safety and non safety circuits;
(3) severe meteorological events;
(4) missiles;
(5) internal flooding; and
(6) fire protection.

The following additional actions were taken as part of the upgrade:

(1) system/component protection features were maintained in the upgrade;
(2) support system performance was verified;
(3) system/component redundancy and independence was assured where required; and
(4) operation and testing history for the vertical motor-driven cooling water pump was evaluated.

Failures of systems and components involved in the upgrade were analyzed to determine if the safety function could be assured. It

was determined that all required safety functions could be assured.

Specification 3.3.D.1.a simplifies previous specification 3.3.D.1.a and b and is being revised to require that cooling water header isolation valves be prealigned and administratively controlled whenever the vertical motor-driven cooling water pump is being used as a safeguards pump. This prealignment does not increase the probability or consequences of an accident previously evaluated since the prealignment places the cooling water header isolation valves in the positions required to respond to analyzed events.

Specification 3.3.D.1.d is being added to clarify the minimum fuel supply requirement of 19,000 gallons for the diesel-driven cooling water pumps. This change is considered administrative in that it does not reflect any change to the physical plant or any change to the operation of the plant and as such is not considered to affect the probability or consequences of an accident previously evaluated.

Revised specification 3.3.D.2.a simplifies the previous specification.

Specification 3.3.D.2.a.(2) specifically applies only to Unit 1 since the existing diesel generators, D1 and D2, are being dedicated to Unit 1; and the new Unit 2 diesel generators, D5 and D6, do not require cooling water system flow. This is considered an administrative clarification and as such is not considered to affect the probability or consequences of an accident previously evaluated.

Specification 3.3.D.2.a.(2) clarifies that both paths from the transmission grid are to the unit rather than plant 4kV safeguards buses. This change is considered administrative in that it does not reflect any change to the physical plant or any change to the operation of the plant and as such is not considered to affect the probability or consequences of an accident previously evaluated.

For the reasons discussed above, the proposed amendment does not significantly increase the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

The upgrade of the vertical motor-driven cooling water pump and supporting systems reflected in the proposed Technical Specifications changes was evaluated to determine if it could create the possibility of a new or different kind of accident from any accident previously evaluated.

The upgrade was evaluated to determine the types of accidents which could result from malfunction of the upgraded systems and components. It was determined that no new or different kinds of accidents from those previously evaluated are created. USAR analyses remain bounding.

In addition, the upgrade reflected the proposed Technical Specifications changes was evaluated determine types of failure modes which were not previously evaluated. The following failures were evaluated:

(1) failures in the power supplies to 4kV safeguards bus 27 (on which the upgraded cooling water pump is loaded) from 4kV safeguards buses 25 and 26;
(2) failure of the 4kV safeguards bus 27 itself;
(3) failure of the power supply cable to the vertical motor-driven cooling water pump;
(4) failure of the pump speed switch at either diesel-driven cooling water pump;
(5) loss of DC control power to the vertical motor-driven cooling water pump breakers due to transfer switch failure;
(6) loss of power to half of the cooling water header isolation valves; and
(7) failure of a single cooling water header isolation valve.

The failure analysis demonstrated that no single failure can defeat the safety function of the cooling water system.

Specification 3.3.D.1.a is being revised to require that cooling water header isolation valves be prealigned and administratively controlled whenever the vertical motor-driven cooling water pump is being used as a safeguards pump. This prealignment does not create the possibility of a new or different kind of accident from those previously evaluated since the prealignment places the cooling water header isolation valves in the positions required to respond to analyzed events.

The addition of specification 3.3.D.1.d to clarify the minimum fuel supply requirement for the diesel-driven cooling water pumps is considered administrative and as such does not create the possibility of a new or different kind of accident from any previously evaluated.

The change in specification 3.3.D.2.a.(2) to clarify Unit 1 applicability is considered administrative and as such does not create the possibility of a new or different kind of accident from any previously evaluated.

The change in specification 3.3.D.2.a.(2) which clarifies that both paths from the transmission grid are to the unit rather than plant 4kV safeguards buses is considered administrative and as

such does not create the possibility of a new or different kind of accident from any previously evaluated.

For the reasons discussed above, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed amendment will not involve a significant reduction in the margin of safety.

The upgraded cooling water system as reflected in the proposed Technical Specifications changes has the capacity to provide sufficient cooling in one unit during the injection and recirculation phases of a postulated loss of coolant accident plus sufficient cooling to maintain the second unit in a hot standby condition. With respect to each of the diesel-driven cooling water pumps the upgraded vertical motor-driven cooling water pump provides an equivalent and diverse means of providing this cooling water to engineered safety features equipment. Upgrade of the vertical motor-driven cooling water pump and supporting systems provides additional cooling water system reliability and, at a minimum, maintains the margin of safety provided by the cooling water system as currently reflected in the Prairie Island Nuclear Generating Plant Technical Specifications.

The addition of specification 3.3.D.1.d to clarify the minimum fuel supply requirement for the diesel-driven cooling water pumps is considered administrative and as such does not affect the margin of safety.

The change in specification 3.3.D.2.a.(2) to clarify Unit 1 applicability is considered administrative and as such does not affect the margin of safety.

The change in specification 3.3.D.2.a.(2) which clarifies that both paths from the transmission grid are to the unit rather than plant 4kV safeguards buses is considered administrative and as such does not affect the margin of safety.

For the reasons discussed above, the proposed amendment does not involve a significant reduction in the margin of safety.

Based on the evaluation described above, and pursuant to 10 CFR Part 50, Section 50.91, Northern States Power Company has determined that operation of the Prairie Island Nuclear Generating Plant in accordance with the proposed License Amendment Request does not involve any significant hazards considerations as defined by NRC regulations in 10 CFR Part 50, Section 50.92.

b. Technical Specification 4.5

Proposed Changes

Revise specification 4.5.A.5.a to add a surveillance test requiring automatic start of the vertical motor-driven cooling water pump at each refueling outage.

Add specification 4.5.B.1.c to require that the vertical motor-driven cooling water pump be operated at quarterly intervals. The specification is written to reflect that an acceptable level of performance shall be that the pump starts and reaches its required developed head and the control board indications and visual observations indicate that the pump is operating properly for at least 15 minutes.

Reasons for the Proposed Changes

Use of the upgraded vertical motor-driven cooling water pump as a safeguards pump requires a more stringent level of surveillance testing than currently required for this pump. The proposed additions to specifications 4.5.A and 4.5.B provide the more stringent level of surveillance testing commensurate with other engineered safety features testing.

Safety Evaluation and Determination of Significant Hazards Considerations

The proposed changes to the Operating Licenses have been evaluated to determine whether they constitute a significant hazards consideration as required by 10 CFR Part 50, Section 50.91 using the standards provided in Section 50.92. This analysis is provided below:

1. The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The cooling water system is required to have the capacity and capability to provide sufficient cooling in one unit during the injection and recirculation phases of a postulated loss of coolant accident plus sufficient cooling to maintain the second unit in a hot standby condition.

   Cooling water system testing and surveillance demonstrate that the cooling water system is capable of performing its design function. Testing and surveillance for the upgraded vertical motor-driven cooling water pump is necessary to ensure its capacity and capability.

Automatic start of the upgraded vertical motor-driven cooling water pump is being added to the cooling water system test performed at each refueling per specification 4.5.A.5.a.

Further, the proposed change to specification 4.5.B requires the vertical motor-driven cooling water pump to be tested on a quarterly basis. This is consistent with ASME Section XI.

These additional test and surveillance requirements are equivalent to those performed for the other safety-related portions of the cooling water system.

For the reasons discussed above, the proposed amendment does not significantly increase the probability or consequences of an accident previously evaluated.

2. The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously evaluated.

   Testing and surveillance proposed by these specification changes do not constitute new modes of operation for the cooling water system and are equivalent to tests and surveillances performed on other safety-related portions of the cooling water system.

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

3. The proposed amendment will not involve a significant reduction in the margin of safety.

   Testing and surveillance of the vertical motor-driven cooling water pump as specified in the proposed specification changes will provide assurance that the cooling water system will provide sufficient cooling capability.

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

Based on the evaluation described above, and pursuant to 10 CFR Part 50, Section 50.91, Northern States Power Company has determined that operation of the Prairie Island Nuclear Generating Plant in accordance with the proposed License Amendment Request does not involve any significant hazards considerations as defined by NRC regulations in 10 CFR Part 50, Section 50.92.

Environmental Assessment

This license amendment request does not change effluent types or total effluent amounts nor does it involve an increase in power level. Therefore, this change will not result in any significant environmental impact.

COMPARISON OF REAL TIME RISK-BASED DIESEL GENERATOR AOTs
AND CURRENT PLANT TECHNICAL SPECIFICATIONS

Diesel Generator(s) Unavailable	Unit 1 Core Damage Frequency (Per Year)	Change in Unit 1 CDF (Per Year)	Real-Time Risk-Based AOT [1] For Unit 1 (Hours)	Real-Time Risk-Based AOT For Unit 2 [2] (Hours)	Current AOT [3] (Hours)
None (Base Case IPEM Results)	9.87E-06	0	--	--	--
D1	1.86E-05	8.70E-06	481 [4]	-- [5]	168
D2	1.86E-05	8.70E-06	482 [4]	-- [5]	168
D5	1.02E-05	4.02E-07	-- [5]	481 [4]	168
D6	1.02E-05	3.92E-07	-- [5]	482 [4]	168
D1, D2	2.58E-04	2.78E-04	16	237	2
D1, D5	2.40E-05	1.41E-05	311	311	Undetermined
D1, D6	2.35E-05	1.37E-05	320	320	Undetermined
D2, D5	2.36E-05	1.37E-05	320	320	Undetermined
D2, D6	2.39E-05	1.41E-05	311	311	Undetermined
D5, D6	2.83E-05	1.85E-05	237	16	Undetermined

[1] Allowed Outage Time (AOT) based on NUREG/CR-5742 Eq. 3.2; $\Delta CD * AOT \leq 5.0E-7$ (rounded to the nearest whole hour).

[2] The IPEM study was a Unit 1 model which applies to Unit 2 also (because the two units are essentially identical). Each diesel generator provides primary emergency power to its respective unit and backup emergency power to the opposite unit. Therefore, the Unit 2 AOT for a Unit 1 primary diesel generator will be approximately equal to the Unit 1 AOT of the train-related Unit 1 backup diesel generator, etc.

[3] Current maximum AOTs based on T/S 3.7.B.1, and apply to both units since D1 and D2 are shared by both units.

[4] This AOT was reduced slightly to account for this diesel's backup power function for the opposite unit (see [5]).

[5] The calculated AOT for this diesel with respect to the unit specified indicates that it may be out of service for the entire year without increasing risk > 5.0E-07. The actual change in CDF for this diesel has been taken into account by adding it to its ΔCDF with respect to the unit to which it is dedicated, and decreasing that AOT by the corresponding amount.

Figure 1

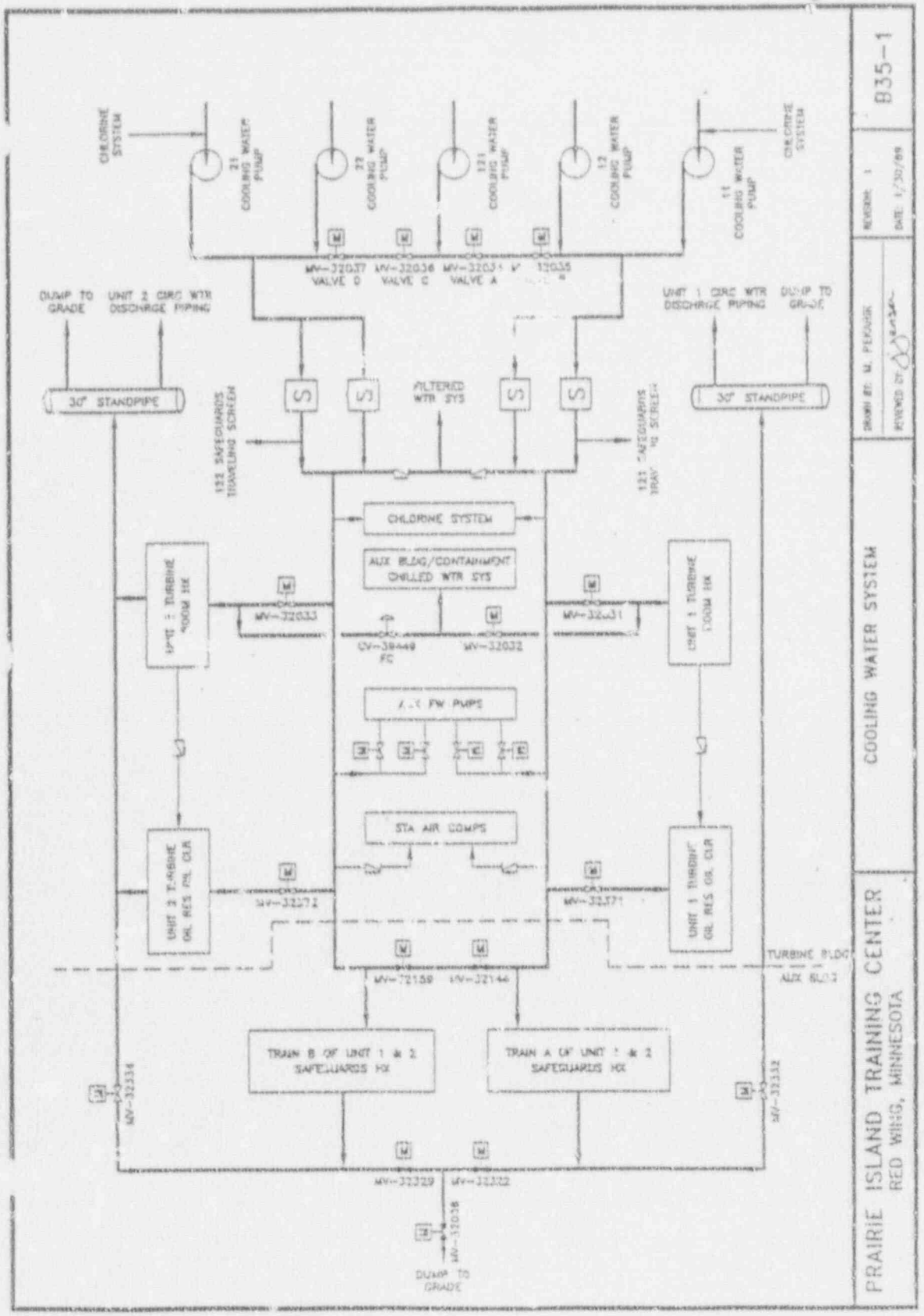
CHLORINE SYSTEM
21 COOLING WATER PUMP
22 COOLING WATER PUMP
121 COOLING WATER PUMP
12 COOLING WATER PUMP
11 COOLING WATER PUMP
CHLORINE SYSTEM
MV-32037 VALVE D
MV-32036 VALVE C
MV-32035 VALVE A
DUMP TO GRADE
UNIT 2 CIRC WTR DISCHARGE PIPING
UNIT 1 CIRC WTR DISCHARGE PIPING
DUMP TO GRADE
30" STANDPIPE
30" STANDPIPE
121 SAFEGUARDS TRAVELING SCREEN
FILTERED WTR SYS
121 SAFEGUARDS SPRAY WASH SCREEN
CHLORINE SYSTEM
AUX BLDG/CONTAINMENT CHILLED WTR SYS
UNIT 2 TURBINE ROOM HX
UNIT 1 TURBINE ROOM HX
MV-32033
MV-32031
CV-38449
MV-32032
AFW PUMPS
STA AIR COMPS
UNIT 2 TURBINE OIL RES OIL CLR
UNIT 1 TURBINE OIL RES OIL CLR
MV-32372
MV-32371
TURBINE BLDG
AUX BLDG
MV-32159
MV-32144
TRAIN B OF UNIT 1 & 2 SAFEGUARDS HX
TRAIN A OF UNIT 1 & 2 SAFEGUARDS HX
MV-32334
MV-32332
MV-32329
MV-32322
MV-32038
DUMP TO GRADE
PRAIRIE ISLAND TRAINING CENTER
RED WING, MINNESOTA
COOLING WATER SYSTEM
B35-1

Figure 2