Northern States Power Company

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10 CFR Part 50
Section 50.90

U S Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Supplement to License Amendment Request Dated May 4, 1995
Pressurizer Safety Valves and Main Steam Safety Valves Lift
Setting Tolerance Change and Safety Limit Curve Changes

Pursuant to discussions with your staff regarding the subject license amendment request, Northern States Power Company provides the following supplemental information.

Exhibit A, Page 6, Paragraph 2 indicates that the pressurizer safety valves will limit the RCS pressure to 2637 psig. This value of 2637 psig is the pressure at which the pressurizer safety valves are calculated to be full open, that is, setpoint plus the proposed tolerance of 3% plus 3% for accumulation.

The limiting transient with respect to maximum RCS pressure is the Loss of External Load Transient (Turbine Trip). The methodology that NSP uses to evaluate this transient is outlined in NSP's topical report Prairie Island Nuclear Plant Reload Safety Evaluation Methods For Application to Prairie Island Units, NSPNAD-8102-A,

A001 /0

Rev. 6 Section 3.6. The relevant assumptions used in the turbine trip transient are the following:

1. No credit is taken for tripping the reactor directly from a turbine trip.
2. No credit is taken for steam bypasss actuation.
3. No credit is taken for pressurizer pressure control (sprays).
4. No credit is taken for opening the pressurizer relief valves.
5. No credit is taken for opening the steam generator relief valves.
6. Transient is initiated at an RCS pressure of 2265 psig which is the nominal operating pressu ; plus 30 psi measurement uncertainty.
7. Pressurizer safety valve modeled parameters:

Nominal setpoint pressure	= 2485 psig
Lifting pressure (nominal plus 3% tolerance)	= 2560 psig
Full open pressure (lifting plus 3% accumulation)	= 2637 psig

8. Main Steam safety valve modeled parameters:

Nominal setpoint pressure (lowest of the 5)	= 1077 psig
Lifting pressure (nominal plus 3% tolerance)	= 1109 psig
Full open pressure (lifting plus 3% accumulation)	= 1143 psig

The rest of the valves are modeled similarly assuming the same 3% tolerance and the 3% accumulation from the nominal points at 1093, 1110, 1120, and 1131 psig.

The results of the Turbine Trip Transient show a peak RCS pressure of 2560 psig (2735 psig limit). The calculated peak RCS pressure was, coincidentally, the modeled lifting pressure of the pressurizer safeties (nominal plus 3% tolerance). The RCS pressure does not approach the additional 3% accumulation pressure to fully open the valve.

Exhibit A, Page 8, Paragraph 4 discusses the capability of the main steam safety valves to limit the main steam system pressure. This paragraph makes reference to "loss of all heat sink at rated reactor thermal power." This phraseology comes from ASME code and is applicable to the vessel which is protected by the safety valves. In this case the steam generator is being protected and the loss of heat sink means that all the steam is discharged through the main steam line safety valves Without consideration of any specific plant transient, the maximum steam line pressure was calculated based on the physical capability of the valves assuming rated reactor power, the safety valves lift 3% above nominal and 3% accumulation. If this calculation is performed assuming 102% reactor power to account for calorimetric error, the pressure is limited to 1188 psig which is below the code limit of 1195 psig.

The limiting plant transient for main steam line pressure is the Loss of External Load Transient (Turbine Trip). This Turbine Trip Transient is the same transient discussed above except that the pressurizer pressure controller was modeled to control RCS pressure as designed which maintains the reactor at power longer and increases the severity of the transient for the secondary system. The peak steam line pressure for this transient was calculated to be 1153 psig. which caused only the first three safety valves to open assuming all the valves lift at nominal plus 3%.

The subject LAR makes brief reference to LOCA analyses on pages 7 and 8 of Exhibit A. More detailed discussion of LOCA analyses follows.

The large break LOCA is not affected by the setpoints of the pressurizer safety valves or the main steam safety valves. In both the reactor coolant system and the main steam system, the pressure decreases during the large break LOCA. WCAP-13919 provides additional information on this evaluation.

Like the large break LOCA, in the small break LOCA the pressurizer safety valves never lift because the RCS pressure decreases during the transient and the RCS does not repressurize. However, the small break LOCA is affected by the setpoint of the main steam system safety valves because the secondary side of the steam generators is effectively isolated during the transient causing the steam pressures to increase near the lift pressures of the safety valves. The main assumptions for this transient are:

1. 4 inch, 6 inch and 8 inch break sizes were modeled.
2. Safety Injection and reactor trip occur at 1700 psia.
3. Single failure is a safeguards bus, that is, loss of one Safety Injection pump.
4. Loss of offsite power coincident with reactor trip. This causes the following events which effectively isolate the secondary side of the steam generators:
   - a) RCP trip
   - b) Turbine trip and isolation
   - c) Feedwater trip, isolation, and actuation of auxiliary feedwater
   - d) Loss of capability of steam dump to condenser
5. Main Steam System Safety Valve modeled parameters:

Nominal setpoint pressure (lowest of the 5)	= 1077 psig
Lifting pressure (nominal plus 3% tolerance)	= 1109 psig
Full open pressure (lifting plus 3% accumulation)	= 1143 psig

   The rest of the valves are modeled similarly assuming the same 3% tolerance and 3% accumulation from the nominal points at 1093, 1110, 1120, and 1131 psig.

The results show that the main steam line pressure never gets above 1109 psig which is the setpoint of the lowest pressure safety valve. The RCS pressure decreases during the transient and the RCS does not repressurize. The limiting Peak Clad Temperature for the small break LOCA occurs in the 6 inch break case in which the temperature is limited to 1194.9 °F including the effects of the annular pellet blankets. Prairie Island core reloads have had annular pellet blankets since Prairie Island went to Westinghouse Vantage+ fuel in Unit 2 Cycle 16. This Peak

Clad Temperature is well below the regulatory limit of 2200 °F. Additional information on the Prairie Island small break LOCA can be found in WCAP-13920.

Exhibit A, Page 6, Paragraph 4 states that the Generic Letter 89-10 program RCS valves were evaluated for performance at the pressurizer safety valve nominal setpoint plus 3%. This is considered acceptable since the only RCS Generic Letter 89-10 program valves dependent on the pressurizer safety valve setpoint were the Post Accident RCS Sample Valves. These valves are used only for post accident planning and are not required to function at an elevated transient pressure. Therefore, pressurizer safety valve nominal setpoint pressure plus 3% setpoint tolerance is acceptable.

A revised Safety Evaluation, Significant Hazards Determination and Environmental Assessment have not been submitted with this supplemental information since these evaluations as originally presented in the May 4, 1995 submittal continue to bound the proposed license amendment.

If you have any questions related to this information in support of the subject license amendment request, please contact myself or Dale Vincent at 612-388-6758 X4107.

MD Wadley

M. D. Wadley
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Prairie Island Nuclear Generating Plant

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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 May 4, 1995

Northern States Power Company, a Minnesota corporation, provides this supplemental information in support of its license amendment request dated May 4, 1995. This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By MDWadley
M. D. Wadley
Plant Manager
Prairie Island Nuclear Generating Plant

On this 28th day of November 1995 before me a notary public in and for said County, personally appeared M. D. Wadley, Plant Manager, Prairie Island Nuclear Generating Plant, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, tha[illegible] knows the contents thereof, and that to the best of his knowledge, information, [illegible] 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 Jan. 31, 2000