December 3, 1998

Mr. Roger O. Anderson, Director
Nuclear Energy Engineering
Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55401

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 - CHANGES TO TECHNICAL SPECIFICATION BASES ON ALLOWABLE LEAKAGE PAST REACTOR VESSEL HEAD PENETRATION SEAL WELDS

Dear Mr. Anderson:

By letter from Mr. Joel Sorensen dated November 3, 1998, Northern States Power Company (NSP) informed NRC that it had changed bases pages B.3.1-7 and B.3.1-7a for the station technical specifications in accordance with its Prairie Island Bases Control Program.

In response, we have updated the Prairie Island Bases with the bases pages provided in the November 3, 1998, letter. The two revised bases pages for Prairie Island Units 1 and 2 are enclosed.

Sincerely,

ORIGINAL SIGNED BY

Tae Kim, Senior Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosure: As stated

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3.1 REACTOR COOLANT SYSTEM

Bases continued

C. Reactor Coolant System Leakage

Leakage from the reactor coolant system is collected in the containment or by other systems. These systems are the main steam system, condensate and feedwater system and the chemical and volume control system.

Detection of leaks from the reactor coolant system is by one or more of the following (Reference 1):

1. An increased amount of makeup water required to maintain normal level in the pressurizer.
2. A high temperature alarm in the leakoff piping provided to collect reactor head flange leakage.
3. Containment sump water level indication.
4. Containment pressure, temperature, and humidity indication.

If there is significant radioactive contamination of the reactor coolant, the radiation monitoring system provides a sensitive indication of primary system leakage. Radiation monitors which indicate primary system leakage include the containment air particulate and gas monitors, the area radiation monitors, the condenser air ejector monitor, the component cooling water monitor, and the steam generator blowdown monitor (Reference 2).

The historical leak rate limit of 1 gpm corresponded to a through wall crack less than 0.6 inches long based on test data. Steam generator tubes having a 0.6-inch long through-wall crack have been shown to resist failure at pressures resulting from normal operation, LOCA, or steam line break accidents (Reference 3).

The leakage limits incorporated into Specification 3.1.C for implementation of the Steam Generator Voltage Based Alternate Repair Criteria are more restrictive than the standard operating leakage limits and are intended to provide an additional margin to accommodate a crack which might grow at a greater than expected rate or unexpectedly extend outside the thickness of the tube support plate. Hence, the reduced leakage limit, when combined with an effective leak rate monitoring program, provides additional assurance that should a significant leak be experienced in service, it will be detected, and the plant shut down in a timely manner.

Seal welds are provided at the threaded joints at all reactor vessel head penetrations (spare penetrations, part-length CRDMs, full-length CRDMs, and thermocouple columns). Although these seals are a portion of the reactor coolant pressure boundary as defined in 10CFR50 Section 50.2, minor leakage through the threads past the seal weld is not a fault in the reactor coolant system pressure boundary or a structural integrity concern. Pressure retaining components are differentiated from leakage barriers in the ASME Boiler and Pressure Vessel Code. In all cases, the joint strength is provided by the threads of the closure joint.

3.1 REACTOR COOLANT SYSTEM

Bases continued

Specification 3.1.C.3 specifies actions to be taken in the event of failure or excessive leakage of a check valve which isolates the high pressure reactor coolant system from the low pressure RHR system piping.

References

1. USAR, Section 6.5
2. USAR, Section 7.5.1
3. Testimony by J Knight in the Prairie Island public hearing on January 28, 1975, pp 13-17.