

January 18, 2002

Mr. Mano Nazar
Site Vice President
Prairie Island Nuclear Generating Plant
Nuclear Management Company, LLC
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 -
OPPORTUNITY FOR COMMENT ON TIA 2001-02, DESIGN BASIS
ASSUMPTIONS FOR NON-SEISMIC PIPING FAILURE
(TAC NOS. MB1402 AND MB1403)

Dear Mr. Nazar:

The Nuclear Regulatory Commission (NRC) staff has completed its review of the subject Task Interface Agreement (TIA) request, dated March 27, 2001, from the NRC's Region III office. This TIA requested the Office of Nuclear Reactor Regulation (NRR) staff's assistance in resolving issues related to design-basis assumptions for the service water system operations at the Prairie Island Nuclear Generating Plant. The purpose of this letter is to provide you with the opportunity to respond to the NRR staff's preliminary conclusions made in the enclosed draft TIA response. In developing the enclosed TIA response, the NRR staff considered your letter dated September 17, 2001, as well as other relevant licensing basis documents.

Our internal procedures encourage the input of licensees or other external stakeholders in order to ensure all relevant information has been considered in responding to a TIA. While you are not required to respond to this letter, your staff has previously indicated a desire to review and comment on the staff's draft TIA response.

If you decide to respond to this letter, we request that your response be provided within 60 days of receipt of this letter. Please feel free to contact me at (301) 415-1392 if you have any questions.

Sincerely,

/RA/

Tae Kim, Senior Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosure: Response to TIA 2001-02

cc w/encl: See next page

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Prairie Island Nuclear Generating Plant,
Units 1 and 2

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May 2001

OFFICE OF NUCLEAR REACTOR REGULATION STAFF'S RESPONSE
TO TASK INTERFACE AGREEMENT (TIA) 2001-02
"PIPE FAILURE CRITERIA FOR THE COOLING WATER SYSTEM
AT THE PRAIRIE ISLAND NUCLEAR GENERATING STATION"

1.0 BACKGROUND

By memorandum dated March 27, 2001, Region III requested the Office of Nuclear Reactor Regulation (NRR) staff's assistance to resolve an inspection-related finding concerning design assumptions for seismic qualification of nonsafety-related piping at the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2. The following two issues were identified in TIA 2001-02:

Issue (1)

From a design basis perspective for system functional capability, can non-seismically analyzed piping be assumed to only leak as specified in BTP MEB 3-1, or should non-seismic piping be assumed to fail completely?

Issue (2)

From a design basis perspective for system functional capability, can piping designed for a Uniform Building Code (UBC) Zone 1 earthquake loading of 0.05g be considered seismically qualified piping?

2.0 NRR STAFF'S RESPONSE TO ISSUE (1)

The current NRC review criteria for piping breaks is specified in the Standard Review Plan (SRP), Sections 3.6.1 and 3.6.2, and in Regulatory Guide (RG) 1.29. However, the licensing application for the Prairie Island units was reviewed by the NRC before the SRP and RG 1.29 criteria were implemented. Therefore, these criteria (including Backfit Test Program (BTP) MEB 3-1) do not apply to PINGP. As a point of clarification, BTP MEB 3-1 provides guidance for postulating pipe failures (breaks and cracks) that occur as initiating events during normal plant operation, and this guidance does not apply to the situation where pipe failures are postulated as a consequence of a seismic event.

The design basis of the PINGP units with respect to earthquake protection is discussed in the Final Safety Analysis Report (FSAR) that was in effect at the time of licensing of the plant. FSAR Appendix B, "Special Design Procedures," Section B.7.2(a), "Design Criteria for Class I Vessels, Piping, and Supports," states that critical components must not lose the capability to perform their safety function during a design-basis earthquake (DBE). This capability is ensured by limiting the stresses that are induced in Class I piping by the DBE so that they are not sufficient to cause a pipe rupture. Non-Class I piping does not satisfy this criteria and therefore, pipe ruptures of non-Class I piping is not precluded during a DBE. Consequently, critical components must be able to perform their safety function assuming the complete rupture of non-Class I piping during a DBE. This is consistent with the seismic design criteria that is stated in RG 1.29, which is a reflection of the staff's review practices that were being used during the time when the PINGP units were licensed.

ENCLOSURE

3.0 NRR STAFF'S RESPONSE TO ISSUE (2)

Structures, systems, and components of a nuclear power plant that are important to safety are required to withstand the effects of earthquakes without a loss of the capability to perform their safety functions. The earthquake for which these plant features are designed is defined as a safe-shutdown earthquake (SSE) and described in the licensing basis documentation for the plant. Those plant features that are designed to remain functional if an SSE occurs are considered to be seismically functional.

The seismic design load at PINGP is 0.12g for an SSE. Therefore, the use of 0.05g in the licensee's analysis for the subject piping system to demonstrate its seismic qualification is not acceptable. The licensee should use its licensing-basis SSE of 0.12g in a suitable dynamic analysis for the purpose of demonstrating its seismic adequacy.

With respect to the use of a UBC analysis, the staff does not consider this analysis as a rigorous dynamic analysis to demonstrate the seismic qualification of a piping system. However, a UBC analysis would be acceptable if: (1) the SSE of 0.12g is used in the analysis and (2) an acceptable analytical approach or method is employed such that the results of the analysis are comparable to those obtained by the use of methods described in the licensee's FSAR for the Category 1 piping system.

Based on the above discussions, the NRR staff concludes that a piping system designed based on the UBC Zone 1 earthquake loading of 0.05g can not be considered as seismically qualified. The NRR staff considers that any analysis performed to establish the seismic qualification of the piping system must utilize the licensing-basis SSE of 0.12g, and meet the acceptance criteria set forth in the FSAR for PINGP.