



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

October 1, 1998

Docket  
file

50-282

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

SUBJECT: PRAIRIE ISLAND - REQUEST FOR ADDITIONAL INFORMATION  
CONCERNING NORTHERN STATES POWER COMPANY'S RESPONSE TO  
GENERIC LETTER (GL) 97-01, "DEGRADATION OF CRDM/CEDM NOZZLE  
AND OTHER VESSEL CLOSURE HEAD PENETRATIONS"  
(TAC NOS. M98588/M98589)

Dear Mr. Anderson:

On April 1, 1997, the staff issued Generic Letter (GL) 97-01, "Degradation of CRDM/CEDM Nozzle and Other Vessel Closure Head Penetrations," to the industry requesting in part that addressees provide a description of the plans to inspect the vessel head penetration nozzles (VHPs) at their respective pressurized water reactor (PWR) designed plants. With respect to the issuance of the GL, the staff required the addressees to submit an initial response within 30 days of issuance informing the staff of the intent to comply with requested information and a follow-up response within 120 days of issuance containing the technical details to the staff's information requests. In the discussion section of the GL, the staff stated that "individual licensees may wish to determine their inspection activities based on an integrated industry inspection program. . .," and indicated that it did not object to individual PWR licensees basing their inspection activities on an integrated industry inspection program.

As a result, the Westinghouse Owner's Group (WOG) determined that it was appropriate for its members to develop a cooperative integrated inspection program in response to GL 97-01. The WOG program is documented in two Topical Reports issued by the Westinghouse Electric Corporation (WEC), WCAP-14901, Revision 0, "Background and Methodology for Evaluation of Reactor Vessel Closure Head Penetration Integrity for the Westinghouse Owners Group," and WCAP-14902, Revision 0, "Background Material for Response to NRC Generic Letter 97-01: Reactor Vessel Closure Head Penetration Integrity for the Westinghouse Owners Group."

The WOG submitted the integrated programs described in WCAP-14901 and WCAP-14902 to the staff on July 18, 1997.

The staff has determined by Northern States Power Company (NSP) letters dated May 1 and July 29, 1997, that you were a member of the WOG and a participant in the WOG integrated program that was developed to address the staff's requests in GL 97-01. In your letters of dates May 1 and July 29, 1997, you also indicated that the information in WEC Topical Report WCAP-14901 is applicable with respect to the assessment of VHP nozzles at the Prairie Island Nuclear Generating Plant.

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The staff has reviewed your responses to GL 97-01, dated May 1, July 29, and December 31, 1997 and requires further information to complete its review of your responses as they relate to the WOG's integrated program for assessing VHP nozzles at WOG member plants, and to the contents of Topical Report No. WCAP-14901. The enclosure to this letter forwards the staff's inquiries in the form of a request for additional information (RAI).

The staff requests a response to the RAI within 90 days of the date of this letter. It should be noted that similar staff requests have been issued to other WOG member utilities. As was the staff's position before, the staff encourages you to address these inquiries in integrated fashion with the WOG and the Nuclear Energy Institute; however, the staff also requests that you identify any deviations from the WOG's integrated program that may be specific to your facilities. The staff appreciates the efforts expended with respect to this matter.

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, 50-306

Enclosure: Request for Additional Information

cc w/encl: See next page

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Mr. Roger O. Anderson, Director  
Northern States Power Company

Prairie Island Nuclear Generating  
Plant

cc:

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Request for Additional Information Regarding Utilities Participating  
in the Westinghouse Owners Group (WOG)  
Response to Generic Letter (GL) 97-01  
"Background and Methodology for Evaluation of Reactor Vessel  
Closure Head Penetration Integrity for the Westinghouse Owners Group"  
Topical Report No. WCAP-14901, Revision 0

Applicability of Topical Report No. WCAP-14901, Revision 0,  
to the Plant-specific Responses to GL 97-01 for Participating  
Member Utilities and Plants in the WOG

Relationship and Applicability of WCAP-14901, Revision 0, to GL 97-01 and the WOG

On April 1, 1997, the staff issued GL 97-01, "Degradation of CRDM/CEDM Nozzle and Other Vessel Closure Head Penetrations," to the industry requesting in part that addressees provide a description of the plans to inspect the vessel head penetration nozzles (VHPs) at their respective pressurized water reactor (PWR) designed plants. With respect to the issuance of the GL, the staff required the addressees to submit an initial response within 30 days of issuance informing the staff of the intent to comply with requested information and a follow-up response within 120 days of issuance containing the technical details to the staff's information requests. In the discussion section of the GL, the staff stated that "individual licensees may wish to determine their inspection activities based on an integrated industry inspection program. . .," and indicated that it did not object to individual PWR licensees basing their inspection activities on an integrated industry inspection program.

As a result, the WOG determined that it was appropriate for its members to develop a cooperative integrated inspection program in response to GL 97-01. The WOG program is documented in two Topical Reports issued by the Westinghouse Electric Corporation (WEC), WCAP-14901, Revision 0, "Background and Methodology for Evaluation of Reactor Vessel Closure Head Penetration Integrity for the Westinghouse Owners Group," and WCAP-14902, Revision 0, "Background Material for Response to NRC Generic Letter 97-01: Reactor Vessel Closure Head Penetration Integrity for the Westinghouse Owners Group."

The technical content provided in WCAP-14901, Revision 0, is basically the same as that provided in WCAP-14902. The difference with regard to the reports is that WOG member plants subscribing to the content of WCAP-14901 have opted to rank the susceptibility of their vessel head penetrations according to a probabilistic Weibull analysis method that was developed by WEC. In contrast, the WOG member plants subscribing to the content of WCAP-14902, Revision 0, have opted to rank the vessel head penetrations for their facilities according to a probabilistic methodology that was developed by another vendor of choice. The staff has determined by letters dated May 1, July 29, and December 31, 1997, that you were a member of the WOG and a participant in the WOG integrated program that was developed to address the staff's requests in GL 97-01. In your letters dated May 1, July 29, and December 31, 1997, you also indicated that the information in WEC Topical Report WCAP-14901 is applicable with respect to the assessment of VHP nozzles at the Prairie Island Nuclear Generating Plant.

Enclosure

The staff has reviewed your responses to GL 97-01, dated May 1, July 29, and December 31, 1997, and requires further information to complete its review of your responses as they relate to the WOG's integrated program for assessing VHP nozzles at WOG member plants, and to the contents of Topical Report No. WCAP-14901. The staff requests the following information with respect to the content of your responses to GL 97-01, dated May 1, July 29, and December 31, 1997, and to the content of WCAP-14901 as it relates to these responses:

1. In WCAP-14901 WEC did not provide any conclusions as to what the probabilistic failure model would lead the WOG to conclude with respect to the assessment of primary water stress corrosion cracking (PWSCC) in WEC-designed vessel head penetrations. With respect to the probabilistic susceptibility model (e.g., probabilistic failure model) provided in WCAP-14901:
  - a. Provide the susceptibility rankings compiled for the WOG member plants for which WCAP-14901 is applicable. In regard to other WOG member plants to which WCAP-14901 is applicable, include the basis for establishing the ranking of your plant(s) relative to the others.
  - b. Describe how the probabilistic failure model in WCAP-14901 for assessing postulated flaws in vessel head penetration nozzles was bench-marked, and provided a list and discussion of the standards the model was bench-marked against.
  - c. Provide additional information regarding how the probabilistic failure models in WCAP-14901 will be refined to allow the input of plant-specific inspection data into the model's analysis methodology.
  - d. Describe how the variability in product forms, material specifications, and heat treatments used to fabricate each CRDM penetration nozzle at the WOG member utilities are addressed in the probabilistic crack initiation and growth models described or referenced in Topical Report No. WCAP-14901.
2. Table 1-2 in WCAP-14901 provides a summary of the key tasks in WEC's vessel head penetration nozzle assessment program. The table indicates that the Tasks for (1) Evaluation of PWSCC Mitigation Methods, (2) Crack Growth Data and Testing, and (3) Crack Initiation Characterization Studies have not been completed and are still in progress. In light of the fact that the probabilistic susceptibility models appear to be dependent in part on PWSCC crack initiation and growth estimates, provide your best estimate when these tasks will be completed by WEC, and describe how these activities relate to and will be used to update the probabilistic susceptibility assessment of VHP nozzles at your plant(s).
3. In the NEI letters of January 29, 1998 (Ref. 1), and April 1, 1998 (Ref. 2), NEI indicated that inspection plans have been developed for the VHP nozzles at the Farley Unit 2

plant in the year 2002, and the Diablo Canyon Unit 2 plant in the year 2001, respectively. The staff has noted that although you have endorsed the probabilistic susceptibility model described in WCAP-14901, Revision 0, other WOG member licensees have endorsed a probabilistic susceptibility model developed by an alternate vendor of choice. The WOG's proposal to inspect the VHP nozzles at the Farley Unit 2 and Diablo Canyon Unit 2 plants appears to be based on a composite assessment of the VHP nozzles at all WOG member plants. Verify that such a composite ranking assessment has been applied to the evaluation of VHP nozzles at your plant(s). If composite rankings of the VHP nozzles at WOG member plants have been obtained from the composite results of the two models, justify why application of the probabilistic susceptibility model described in WCAP-14901, Revision 0, would yield the same comparable relative rankings of the VHP nozzles for your plant(s) as would application of the alternate probabilistic susceptibility model used by the WOG member plants not subscribing to WCAP-14901, Revision 0. Comment on the susceptibility rankings of the VHP nozzles at your plant(s) relative to the susceptibility rankings of the VHP nozzles at the Farley Unit 2 and Diablo Canyon Unit 2 plants.

#### REFERENCES:

1. January 29, 1998 - Letter from David J. Modeen, Director of Engineering, Nuclear Generation Division, Nuclear Energy Institute, to Mr. G.C. Lainas, Acting Director, Division of Engineering, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission (Untitled).
2. April 1, 1998 - Letter from David J. Modeen, Director of Engineering, Nuclear Generation Division, Nuclear Energy Institute, to Mr. G.C. Lainas, Acting Director, Division of Engineering, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, "SUBJECT: Generic Letter 97-01, 'Degradation of Control Rod Drive Mechanism Nozzle and Other Vessel Head Penetrations.' "