



Northern States Power Company

Prairie Island Nuclear Generating Plant

1717 Wakonade Dr. East
Welch, Minnesota 55089

August 15, 1997

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 November 27, 1996
Incorporation of Combustion Engineering Steam Generator
Welded Tube Sleeve Topical Report**

On November 27, 1996, Northern States Power Company submitted a License Amendment Request which proposed changes to Section 4.12 of the Prairie Island Technical Specifications which would allow the use of new steam generator tube sleeve designs and installation and examination techniques as described in Combustion Engineering Topical Report CEN-629-P, Revision 1.

This supplement to the November 27, 1996 License Amendment Request requests the following three changes:

1. An addendum to CEN-629-P is being submitted (Attachments 5 and 6) which provides an assessment of steam generator tube sleeves operating under conditions outside of the bounding values assumed in CEN-629-P, Revision 1. Revision 1 to Addendum 1 of CEN-629-P raises the assumed pressure under main steam line break conditions and lowers the normal operating pressure. The change in main steam line break pressure provides consistency with the steam generator design basis documented in the USAR and the requirements of Generic Letter 95-05. Evaluation of the lower operating pressure provides margin necessary for future increases in plugging and sleeving. An evaluation of Addendum 1 to CEN-629-P is provided in Exhibit A.
2. The sleeve repair limit specified in Technical Specification 4.12.D.1.(f) is reduced as shown in Attachments 2 and 3 from 40% to 31% of the nominal sleeve wall

22006 ATTACHMENT CONTAINS PROPRIETARY INFORMATION TO BE
WITHHELD FROM PUBLIC DISCLOSURE IN ACCORDANCE
WITH 10 CFR PART 2, SECTION 2.790

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thickness to provide additional margin for growth and measurement. An evaluation of the proposed changes to the sleeve repair limit is provided in Attachment 1.

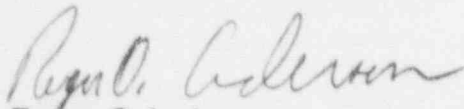
3. It is requested that Revision 2 of CEN-629-P be incorporated into the NRC evaluation of the November 27, 1996 License Amendment Request. Revision 2 to CEN-629-P has been previously submitted to the NRC and approved for use at Kewaunee under Kewaunee License Amendment Number 134. The only change between Revisions 1 and 2 of CEN-629-P is the addition of the Forward. The use of Revision 2 to CEN-629-P is discussed in Attachment 1.

A revised Safety Evaluation, Significant Hazards Determination and Environmental Assessment have not been submitted for the changes proposed by this supplement since, as discussed in Attachment 1, these evaluations, as originally presented in the November 27, 1996 submittal, continue to bound the proposed license amendment as supplemented.

As the attached Revision 1 to Addendum 1 of Combustion Engineering Report CEN-620-P contains information proprietary to Combustion Engineering, Inc., it is supported by an affidavit (Attachment 6) signed by Combustion Engineering, the owner of the information. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in Paragraph (b)(4) of 10 CFR Part 2, Section 2.790 of the Commission's regulations.

Accordingly, it is respectfully requested that the information which is proprietary to Combustion Engineering be withheld from public disclosure in accordance with 10 CFR Part 2, Section 2.790 of the Commission's regulations.

We anticipate utilizing the new sleeve designs in the Unit 1 refueling outage which is now scheduled to begin October 18, 1997. Please contact Gene Eckholt (612-388-1121) if you have any questions related to this supplement.



Roger O Anderson
Director
Nuclear Energy Engineering

- c: Regional Administrator-III, NRC
NRR Project Manager, NRC
Senior Resident Inspector, NRC
State of Minnesota, Attn: Kris Sanda (w/o proprietary attachment)
J E Silberg (w/o proprietary attachment)

Attachments.

Affidavit

- Attachment 1 - Evaluation of Changes Proposed by the August 15, 1997 Supplement to the November 27, 1996 License Amendment Request
- Attachment 2 - Proposed Changes Marked Up on Existing Technical Specification Pages
- Attachment 3 - Revised Technical Specification Pages
- Attachment 4 - Combustion Engineering Report, CEN-629-P, Addendum 1, Revision 1, "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves", August 1997, FINAL REPORT (Proprietary Version)
- Attachment 5 - Combustion Engineering Report, CEN-629-P, Addendum 1, Revision 1, "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves", August 1997, FINAL REPORT (Non-Proprietary Version)
- Attachment 6 - Combustion Engineering Affidavit

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

DOCKET NO. 50-282
50-306

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

LICENSE AMENDMENT REQUEST DATED August 15, 1997

Northern States Power Company, a Minnesota corporation, by this letter dated August 15, 1997, with Attachments 1 through 6, provides supplemental information in support of the subject License Amendment Request dated November 27, 1996. Attachment 1 provides an evaluation of the changes to the subject License Amendment Request proposed by this supplement. Attachments 2 and 3 are copies of the Prairie Island Technical Specifications incorporating the changes proposed by this supplement. Attachments 4 and 5 are the proprietary and non-proprietary versions of Revision 1 to Addendum 1 of Combustion Engineering Topical Report CEN-629-P. Attachment 6 is a Combustion Engineering affidavit for withholding of proprietary information.

This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By

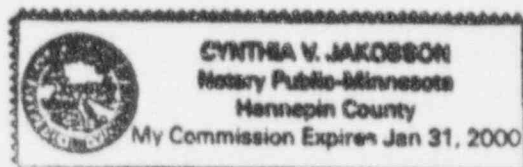
Roger O Anderson

Director

Nuclear Energy Engineering

On this 15th day of August 1997 before me a notary public in and for said County, personally appeared Roger O Anderson, Director, Nuclear Energy Engineering, 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.

Cynthia V Jakobson



Attachment 6

Combustion Engineering Affidavit

AFFIDAVIT PURSUANT

TO 10 CFR 2.790

I, Ian C. Rickard depose and say that I am the Director, Operations Licensing, of Combustion Engineering, Inc., duly authorized to make this affidavit, and have reviewed or caused to have reviewed the information which is identified as proprietary and referenced in the paragraph immediately below. I am submitting this affidavit in conjunction with the application of Northern States Power Company and in conformance with the provisions of 10 CFR 2.790 of the Commission's regulations.

The information for which proprietary treatment is sought is contained in the following document:

Addendum 1, Revision 01, to CEN-629-P, "Repair of Westinghouse Series 44 and 51 Steam Generator Tubes Using Leak Tight Sleeves," August 1997.

This document has been appropriately designated as proprietary.

I have personal knowledge of the criteria and procedures utilized by Combustion Engineering in designating information as a trade secret, privileged or as confidential commercial or financial information.

Pursuant to the provisions of paragraph (b) (4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure, included in the above referenced document, should be withheld.

1. The information sought to be withheld from public disclosure, is owned and has been held in confidence by Combustion Engineering. It consists of

information concerning the steam generator tube repair process of sleeving, including qualification program results and analyses.

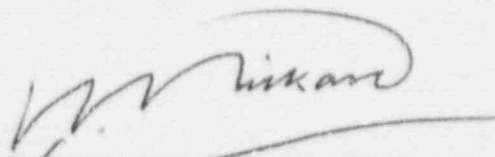
2. The information consists of test data or other similar data concerning a process, method or component, the application of which results in substantial competitive advantage to Combustion Engineering.
3. The information is of a type customarily held in confidence by Combustion Engineering and not customarily disclosed to the public. Combustion Engineering has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The details of the aforementioned system were provided to the Nuclear Regulatory Commission via letter DP-537 from F. M. Stern to Frank Schroeder dated December 2, 1974. This system was applied in determining that the subject document herein is proprietary.
4. The information is being transmitted to the Commission in confidence under the provisions of 10 CFR 2.790 with the understanding that it is to be received in confidence by the Commission.
5. The information, to the best of my knowledge and belief, is not available in public sources, and any disclosure to third parties has been made pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence.
6. Public disclosure of the information is likely to cause substantial harm to the competitive position of Combustion Engineering because:
 - a. A similar product is manufactured and sold by major pressurized water reactor competitors of Combustion Engineering.
 - b. Development of this information by Combustion Engineering required millions of dollars and thousands of manhours of

effort. A competitor would have to undergo similar expense in generating equivalent information.

- c. In order to acquire such information, a competitor would also require considerable time and inconvenience to develop an understanding of welded steam generator tube sleeve installation problems and evaluate specific examples based on test or pulled steam generator tube data and develop and qualify a steam generator tube sleeving program.
- d. The information consists of a description of the steam generator tube repair process of sleeving, including qualification program results and analyses, the application of which provides a competitive economic advantage. The availability of such information to competitors would enable them to modify their product to better compete with Combustion Engineering, take marketing or other actions to improve their product's position or impair the position of Combustion Engineering's product, and avoid developing similar data and analyses in support of their processes, methods or apparatus.
- e. In pricing Combustion Engineering's products and services, significant research, development, engineering, analytical, manufacturing, licensing, quality assurance and other costs and expenses must be included. The ability of Combustion Engineering's competitors to utilize such information without similar expenditure of resources may enable them to sell at prices reflecting significantly lower costs.
- f. Use of the information by competitors in the international marketplace would increase their ability to market nuclear steam supply systems by reducing the costs associated with

their technology development. In addition, disclosure would have an adverse economic impact on Combustion Engineering's potential for obtaining or maintaining foreign licensees.

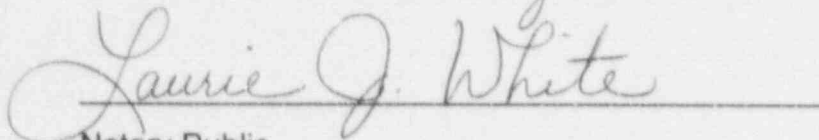
Further the deponent sayeth not.



Ian C. Rickard, Director
Operations Licensing

Sworn to before me

this 14th day of August, 1997



Notary Public

My commission expires: 8/31/99

Attachment 1

Evaluation of Changes Proposed by the August 15, 1997 Supplement to the November 27, 1996 License Amendment Request

1. Evaluation of Revision 1 to CEN-629-P Addendum 1

Purpose of Addendum 1:

Addendum 1 to CEN-629-P provides an assessment of steam generator tube sleeves operating under conditions outside of the bounding values assumed in CEN-629-P, Revision 1. Two assumptions are changed:

- 1) Addendum 1 assumes a Main Steam Line Break Pressure (MSLB) of 2560 psig instead of the original 2250 psig used in CEN-629-P Revision 1.
- 2) Addendum 1 assumes a secondary side pressure of 653 psig instead of the original 690 psig used in CEN-629-P Revision 1.

As a result of these changes, the allowable sleeve wall degradation decreases from 52.4% to 51.5%.

Summary of Results

- Design sizing, which is based on the steam generator primary to secondary side design differential pressure (dp) of 1600 psi, is not affected by these changes.
- The general primary membrane stress for the Main Steam Line Break decreases due to a change in the formula used to calculate differential pressure, such that 2560 psi is used in Addendum 1 versus 2970 psi in CEN-629-P Revision 1. Traditionally, Combustion Engineering has included a shock wave effect for the Main Steam Line Break. This explains the delta p formula in Section 2 on Page 8-5 of CEN-629-P Revision 1. Due to the NRC position on Main Steam Line Break pressure in Generic Letter 95-05, "Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking", Combustion Engineering uses only the 2560 psi value in Addendum 1.
- Values in Table 8-1 (Summary of Sleeve and Weld Analysis Results) of Addendum 1 increase slightly in all cases except the Main Steam Line Break, which decrease slightly. All values remain less than the allowable values of stress or fatigue usage and therefore meet the analytical acceptance criteria previously established in CEN-629-P Revision 1.

- Axial loads in the sleeve increase slightly under normal operating and Main Steam Line Break conditions as shown in Table 8-2 of Addendum 1. (Note that CEN-629-P used 2250 psi for Main Steam Line Break axial loads, not 2970 psi, as was used for primary membrane stress). However, there is still a high safety factor between the axial loads and the pullout capability of the joint, e.g. 3.7 to 1 in the case of the Main Steam Line Break
- The allowable sleeve wall degradation using Regulatory Guide 1.121 is still limited by three times the normal operating pressure conditions and decreases from 52.4% to 51.5%.
- The average minimum weld height increases from 0.011 to 0.013 inches for the Main Steam Line Break, but is still less than the design minimum weld height of 0.020 inches.
- The worst case tube lockup axial load is at 100% power and increases from 1420 to 1458 pounds which is still less than the capacity of the most limiting joint which is 2000 pounds for the lower rolled joint.
- The most limiting fatigue usage is for the upper sleeve joint minimum weld height of 0.020 inches and the usage factor increases from 0.332 to 0.378 which is still less than the design requirement of 1.0.
- There is only minimal effect on the analysis for the Sleeved Tube Plug Weld due to the lower operating pressure.

Thus, lowering the operating pressure and increasing the Main Steam Line Break pressure still results in acceptable performance of the sleeve within the code and design requirements.

Evaluation of Main Steam Line Break Pressure at 2560 psig:

Addendum 1 to CEN-629-P uses 2560 psig for the Main Steam Line Break primary to secondary side differential pressure. This is an assumption that is consistent with the NRC position for Main Steam Line Break pressure taken in Generic Letter 95-05. This position is that "tube integrity analysis should be conducted for an assumed differential pressure across the tube wall equal to the pressurizer safety valve setpoint plus 3 percent for the valve accumulation, less atmospheric pressure in faulted SGs." (page 3 of Attachment 1 to GL 95-05, in Section 2 which deals with Tube Integrity Evaluation under Main Steam Line Break conditions). This assumption is conservative with respect to USAR Section 4, Table 4.10-5 which lists the design pressure of the reactor coolant side of the steam generator as 2485 psig and Table 4.1-4 which lists the pressurizer safety setpoint at 2485 psig. USAR

Table 4.3-9 also lists the Steam Line Break pressure as 2485 psi for the tube sheet stress analysis.

Also, in USAR Section 4.3.2.2, it is stated:

"The rupture of primary or secondary piping has been assumed to impose a maximum pressure differential of 2485 psig across the tubes and tube sheet from the primary side or a maximum pressure differential of 1100 psi across the tubes and tube sheet from the secondary side, respectively" and "The tubes have been designed to the requirements (including stress limitation) of Section III for normal operation, assuming 2485 psig as the normal operation pressure differential. Hence, the secondary pressure loss accident condition imposes no extraordinary stress on the tubes beyond that normally expected and considered in Section III requirements."

In USAR Section 14.5.5.2, it is stated that:

" The acceptance criteria for the large steam line break are as follows:

1. The maximum reactor coolant and main steam system pressures must not exceed 110% of the design values."

However, the results of the Main Steam Line Break Analysis for Prairie Island always result in a cooldown event with the maximum pressure being the initial pressure at the start of the accident. This pressure is shown to be 2280 psia in Tables 3.1 of USAR Appendices 14B and 14C, "Current Unit 1(2) Reload Safety Analysis."

The 2560 psi value is conservative with respect to the USAR and with respect to the current Reload Safety Analyses.

Conclusion

The changes in Main Steam Line Break pressure and the decreased operating pressure assumed in Addendum 1 have only a minimal effect on the loads and stresses experienced by any of the sleeve or plugs designs such that there is adequate margin against operating and faulted conditions. Therefore, application of CEN-629P Addendum 1 to Prairie Island does not change the results of the original Safety Evaluation, Significant Hazards Determination and Environmental Assessment.

2. Evaluation for Allowable Sleeve Wall Degradation Using Regulatory Guide 1.121

Section 8.3 of CEN-629-P develops the repair criteria using Regulatory Guide 1.121. Addendum 1 establishes the percent allowable wall degradation as 51.5 % for the lower operating pressure of 653 psia. (Main Steam Line Break Pressure did not affect this calculation). This provides a margin of 11.5% from the original proposed plugging limit of 40% for NDE uncertainty and degradation growth versus a margin of 12.4% determined in CEN-629-P Revision 1. In the Prairie Island Sleeve Licensee Amendment Request dated November 27, 1996, a margin of 12% was assumed for NDE uncertainty and growth. In order to provide additional margin for measurement uncertainty and degradation growth consistent with other utility sleeve repair criteria, the margin is increased to 20%. This results in a sleeve repair criteria of 31% through wall degradation.

Conclusion

Because the reduction in the repair limit increases the margin to the structural limit of the sleeve, there is no change in the results of the original Safety Evaluation, Significant Hazards Determination and Environmental Assessment.

3. Evaluation of Revision 2 to CEN-629-P.

The only change from Revision 1 to Revision 2 of CEN-629-P is the addition of the Forward on page xvi. The Forward provides guidance and flexibility for implementing improved sleeve installation and inspection techniques using the 10 CFR 50.59 evaluation process.

Conclusion

Because the change from Revision 1 to Revision 2 of CEN-629-P only provides flexibility to improve sleeve installation and inspection techniques using the 10 CFR 50.59 evaluation process, there is no change in the results of the original Safety Evaluation, Significant Hazards Determination and Environmental Assessment.