

Westinghouse Electric POWER COMPANY  
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November 6, 1981

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U. S. NUCLEAR REGULATORY COMMISSION  
Washington, D. C. 20555

Attention: Mr. R. A. Clark, Chief  
Operating Reactors Branch 3

Gentlemen:



DOCKET NO. 50-266  
SLEEVING DEMONSTRATION PROGRAM  
POINT BEACH NUCLEAR PLANT, UNIT 1

Our letter of October 26, 1981 included preliminary results of fatigue and stress analyses in accordance with the ASME Boiler and Pressure Vessel Code, Section III, ("ASME Code") for sleeve designs described in the Point Beach Steam Generator Sleeve Report for Wisconsin Electric Power Company, WCAP-9960, ("Sleeving Report") which was submitted on September 28, 1981. These analyses have now been completed and the results are summarized in Attachment 1. As described in the attachment, the sleeved tube assemblies to be used at Point Beach meet all applicable ASME Code requirements.

The attachment to this letter contains information which is proprietary to the Westinghouse Electric Corporation. In conformance with the requirements of 10 CFR Section 2.796 of the Commission's regulations, we request that the information in Attachment 1 contained within brackets be withheld from public disclosure. Included with the transmittal of the Sleeve Report on September 28, 1981 was an application for withholding from public disclosure and an affidavit from Westinghouse in support of that application. The September 28 application and affidavit set forth the basis on which the bracketed information in Attachment 1 should be withheld from public disclosure.

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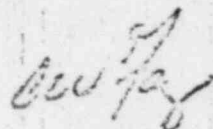
Mr. Harold R. Denton

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November 6, 1961

We would be pleased to answer any further questions you may have regarding this information.

Very truly yours,



G. W. Fay, Director  
Nuclear Power Department

Attachment

Copies to Attached Service List  
NRC Resident Inspector

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of )  
 )  
WISCONSIN ELECTRIC POWER COMPANY ) Docket Nos. 50-266  
 ) 50-301  
(Point Beach Nuclear Plant, ) (OL Amendment)  
Units 1 and 2) )

SERVICE LIST

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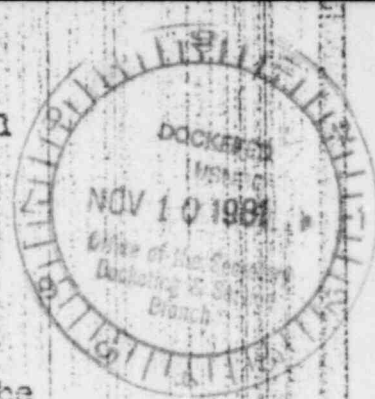
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POINT BEACH NUCLEAR PLANT SLEEVE DESIGN  
RESULTS OF ASME CODE FATIGUE AND STRESS ANALYSES



Fatigue and stress analyses of the sleeved tube assemblies for Point Beach described in the Point Beach Steam Generator Sleaving Report for Wisconsin Electric Power Company, WCAP-9960 ("Sleaving Report"), have been completed in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section III ("ASME Code"). Analyses were performed conservatively for [ ]

[ ] All analyses were performed assuming a [ ] tube below the upper joint, since this condition results in [ ] Figures 1 and 2 indicate schematically the critical sections of the sleeved tube assemblies which were analyzed for these conditions.

The maximum primary (pressure) stresses for the analysis sections in Figures 1 and 2 are summarized in Tables 1 and 2. All primary stresses for the sleeved tube assemblies are well within allowable ASME Code stresses.

Maximum range stress intensity values for the sleeved tube assemblies are summarized in Table 3. For both configurations, the requirements of the ASME Code, Paragraph NB-3222.2 were met directly at most locations and required no further consideration. At the remaining locations indicated in Table 3 the 3Sm limit was met by excluding thermal bending stresses as permitted by the ASME Code, Figure NB-3222-1, Footnote 5, and applying the additional requirements of Paragraph NB-3223.3(a) through (f). After exclusion of thermal bending stresses, stress intensities were less than 3Sm as required by NB-3223.3 and fatigue factors were applied in accordance with NB-3222.4(e) and NB-3223.3(b) and a fatigue analysis was performed in accordance with NB-3223.3(c). For the thermal stress ratcheting requirement of NB-3223.3(d), Case 2 of NB-3222.5 was used. The allowable thermal stress range for the [ ] was calculated to be [ ] Ksi which is well in excess of the calculated maximum total stress intensity of [ ] Ksi at Section X in Figure 1. The allowable thermal stress range for the [ ] was also calculated to be [ ] Ksi which is well in excess of the calculated maximum total stress intensity of [ ] Ksi at Section Y in Figure 2. Thus, the thermal stress ratcheting requirement is met. The maximum temperature of the sleeved tube assemblies is [ ] which is within the range of temperatures specified in NB-3223.3(e) and the

ratio of minimum yield strength to minimum tensile strength is [ ] 12,000 which is less than the limit of 0.80 specified in NB-3222.3(f). Thus, all of the additional requirements of NB-3222.3 are satisfied at the locations where the requirements of NB-3222.2 were not met directly and the sleeved tube assemblies satisfy the applicable requirements of the ASME Code.

Based on the sleeve design criteria presented in Section 3.1 of the Sleeving Report, the fatigue analysis considered a design life objective for the sleeved tube assemblies of 25 years. Tables 6.2-4 through 6.2-6 of the Sleeving Report describe the transient conditions considered in the fatigue analysis. Since these tables provide transients for a 60-year design life objective, the values used in the fatigue analysis were 35/60 of these values. The maximum fatigue strength reduction factor of 5.0 (NB-3222.3(e)) was applied in the radial direction at all points along the [ ] 12,000 configuration which conservatively satisfies the requirements of a simplified elastic-plastic analysis (NB-3222.3) and associated fatigue analysis. In the [ ] 12,000 configuration, fatigue factors (NB-3222.3(b)) were calculated and used at all of the critical fatigue points. The results of the fatigue analysis for the sleeved tube assemblies are summarized in Table 4 for all points of maximum fatigue usage. All of the cumulative usage factors are below the allowable value of 1.0 specified in the ASME Code.

TABLE 2

PRIMARY STRESS RESULTS (( )1<sup>a,c,e</sup>

a,c,e

TABLE 2

PRIMARY STRESS RESULTS

1,0,0,0

1,0,0,0

TABLE 2

MINIMUM STRESS INTENSITY

2,0,0

MINIMUM STRENGTH

2,0,0

Range of primary plus secondary metallographic bending stress intensity, excluding thermal bending stress, for MB-3220.3(a) of Section III, Subsection MD of the ASME Code.



TABLE 1

RANGE OF TOTAL STRENGTH

a, c, e

RANGE OF TOTAL STRENGTH

11 11

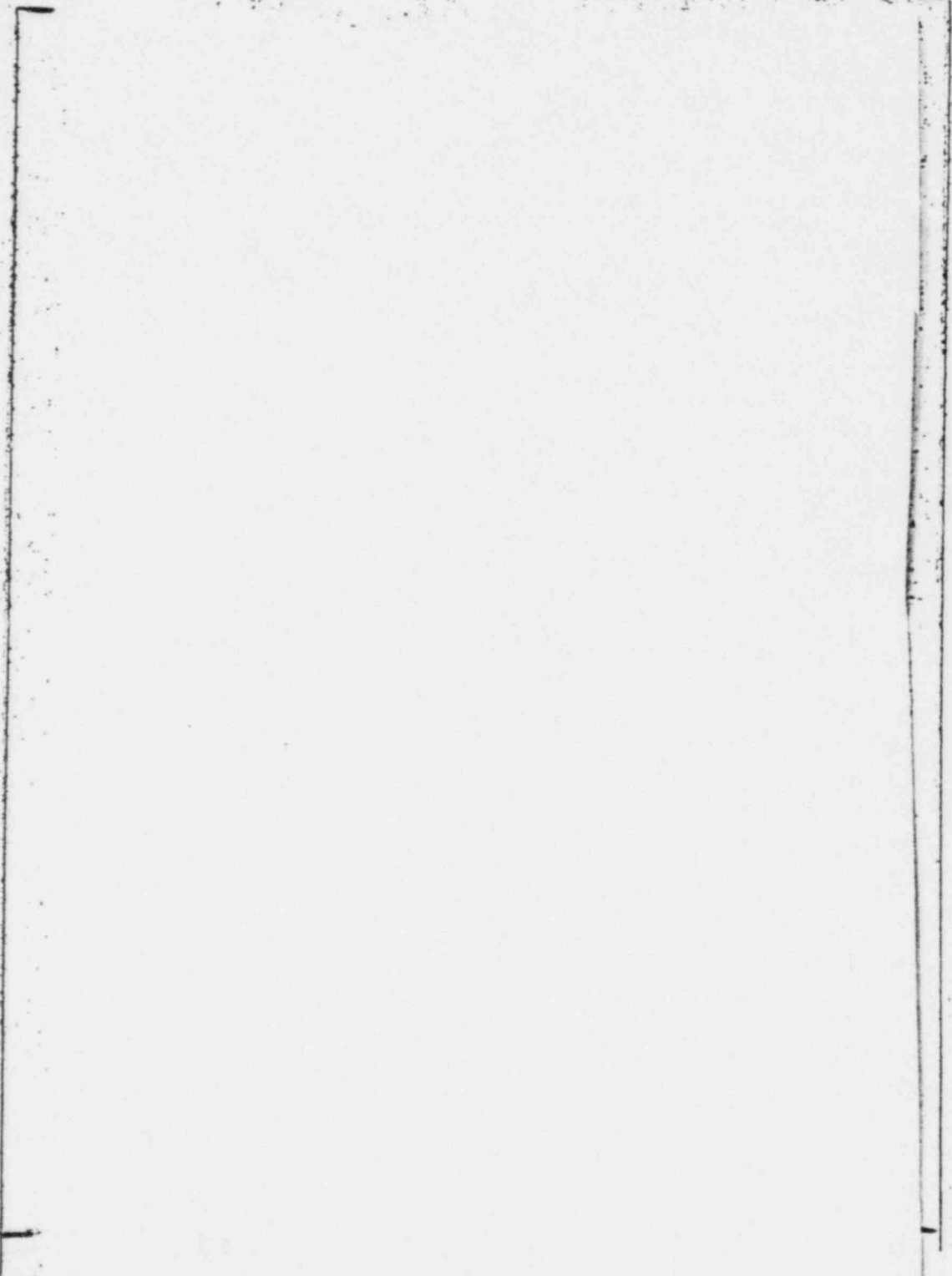
a, c, e

Insignificant results.

1957

22

FIGURE 1



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION



Before the Atomic Safety and Licensing Board

In the Matter of )

WESTINGHOUSE ELECTRIC POWER COMPANY )

Docket Nos. 50-266

(Point Beach Nuclear Plant,  
Units 1 and 2) )

50-301

(OL Amendment)

AFFIDAVIT OF W. D. FLETCHER

County of Allegheny )

: ss

State of Pennsylvania )

W. D. FLETCHER, being duly sworn according to law, deposes and says:

1. I am Manager of Steam Generator Development and Performance Engineering in the Nuclear Technology Division of the Westinghouse Electric Corporation.

2. I am familiar with the information contained in a document entitled: Point Beach Nuclear Plant Sieve Design, Results of ASME Code Fatigue and Stress Analyses.

3. The information in the document is true and correct to the best of my information, knowledge and belief.

4. Further the Affiant says nothing.

W. D. FLETCHER

Subscribed and sworn to before me  
this 6th day of November, 1981.

Robert L. Bryan



UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

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Before the Atomic Safety and Licensing Board

OFFICE OF SECRETARY  
ADMINISTRATIVE & SERVICE  
BRANCH

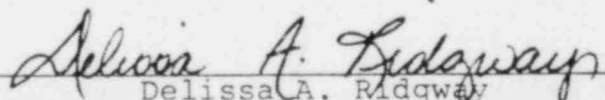
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(Point Beach Nuclear Plant, ) (OL Amendment)  
Units 1 and 2) )

CERTIFICATE OF SERVICE

This is to certify that copies of:

- (1) Letter, Counsel for Licensee to Administrative Judges, dated November 6, 1981, re: Licensee's intended schedule for reply to Decade's oral motion for disclosure of proprietary information on testing;
- (2) Letter, Counsel for Licensee to Administrative Judges, dated November 6, 1981, enclosing items (3) through (5) below;
- (3) Letter, Licensee to Harold R. Denton, dated November 6, 1981, submitting item (4) below;
- (4) "Point Beach Nuclear Plant Sleeve Design, Results of ASME Code Fatigue and Stress Analyses" (proprietary); and
- (5) Affidavit of W.D. Fletcher, dated November 6, 1981;

were served upon those persons on the attached Service List, by U.S. mail, first class, postage prepaid, on November 6, 1981, except that those marked by a single asterisk were served by deposit with Federal Express on November 6, 1981, and those marked by a double asterisk received a non-proprietary version of item (4) above. Items (3), (4) and (5) were hand-delivered to Mr. Tim Colburn of the Nuclear Regulatory Commission on November 9, 1981.

  
Delissa A. Ridgway

Dated: November 10, 1981

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
WISCONSIN ELECTRIC POWER COMPANY	)	Docket Nos. 50-266
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