Washington Public Power Supply System
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Docket Numbers 50-508 and 50-509

January 27, 1982
G03-82-090

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington D. C. 20555

Subject: PROJECT NOS. 3 AND 5
FINAL REPORT OF POTENTIAL 10CFR50.55(e)
SOUTH STEAM GENERATOR BEARING PLATES, UNIT 3 (D/N #038)

Attached is a copy of the final report provided to Region V concerning a potential 10CFR50.55(e) associated with the South Steam Generator Bearing Plates.

Should you have any questions or desire further information, please contact me directly.

R. S. Leddick (1000)
Program Director, WNP-3/5

DRC/tt

Attachment

cc: J. Adams - NESCO-WO/A
D. Smithpeter - BPA-WO/A
Ebasco - New York-WO/A
WNP-3/5 Files - Richland-WO/A

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JP SLUKA-W/A
OE TRAPP-WO/A
JE WERLE-WO/A
GC SORENSEN/440-W/A

THIS LETTER NUMBERED

WPPSS CORRESPONDENCE NO. G03-82-068

Docket Numbers 50-508 and 50-509

January 22, 1982

G03-82-068

U. S. Nuclear Regulatory Commission, Region V
Office of Inspection and Enforcement
1450 Maria Lane, Suite 260
Walnut Creek, California 94596-5368

Attention: Mr. B. H. Faulkenberry
Chief, Reactor Construction Projects Branch

Subject: PROJECT NOS. 3 AND 5
DOCKET NUMBERS 50-508 AND 50-509
FINAL REPORT OF POTENTIAL 10CFR50.55(e)
SOUTH STEAM GENERATOR BEARING PLATES, UNIT 3 (D/N #038)

In accordance with the provisions of 10CFR50.55(e), Region V was notified on October 19, 1981 that a potential deficiency, concerning the subject condition, was found.

Attached is a Supply System approved final report that provides a description of the deficiency, an analysis of the safety implications and corrective actions taken. Based on this evaluation, it is considered that the deficiency would adversely affect the safe operations of the plant and, therefore, is reportable as required by 10CFR50.55(e).

Should you have any questions or desire further information, please contact me directly.

R. S. Leddick (1000)
Program Director, WNP-3/5

DRC/tt

Attachment

cc: J. Adams - NESCO-WO/A
D. Smithpeter - BPA-WO/A
Ebasco - New york-WO/A
WNP-3/5 Files - Richland-WO/A

FOR SIGNATURE OF: RS LEDDICK

AUTHOR: DR COODY:tt

ATTACHMENT I

SOUTH STEAM GENERATOR BEARING PLATES, UNIT 3 (D/N #038)

INTRODUCTION

The NSSS steam generators are supported at the bottom by a sliding base bolted to an integrally attached conical skirt. The sliding base rests on four (4) low friction bearings which allow unrestrained thermal expansion of the Reactor Coolant System. These bearings slide on smooth surfaces of the four (4) bearing plates. The design surface finish required for this smooth sliding operation is 125 microinches (MU). Design thermal expansion of the steam generator between cold and hot function is 1½".

Chicago Bridge and Iron (CB&I) provided the bearing plates with a 125 MU surface finish. Due to installation tolerances, the plate thickness had to be machined to adjust for the gap. Joint Venture (MK-ESI-Lord) sent these plates to Bingham Willamette machine shop in Portland, Oregon. Bingham Willamette machined these plates to the required thickness but did not attain the 125 MU surface finish. Bingham Willamette excluded the surface finish in their Certificate of Compliance. The Joint Venture received, inspected, accepted and subsequently installed the plates in the as-received condition. Personnel who performed the document review during receiving inspection failed to recognize that certification of surface finish was not provided by Bingham-Willamette.

Bearing plates and Steam Generator No. 2 were installed on the south side of Unit No. 3 during the weekend of August 21-22, 1981.

One week after Generator placement, an NCR was initiated by Joint Venture to identify the documentation deficiencies relative to the bearing plate surface finish. The NCR noted that the surface finish of the plates was indeterminate.

Since this could affect the performance of Primary Coolant System, the determination of surface finish was essential and the problem was considered significant.

The NRC was notified on September 20, 1981 in accordance with the provisions of 10CFR50.55(e) and an Interim Report dated November 17, 1981 was issued.

A. DESCRIPTION OF DEFICIENCY

For Steam Generator #2 in Unit 3, the actual surface finish of bearing plates as installed was indeterminate. The installing contractor failed to clearly establish the acceptability of the actual finish through proper documentation prior to installation. After the installation of the steam generator, it was discovered that the receiving inspection of the plates was questionable and the actual conditions of the finishes were indeterminate.

The deficiencies are categorized as follows:

1) Material Deficiency

2) Inspection Deficiency

Material Deficiency:

Ebasco design drawing required a 125 MU finish at the top and bottom surfaces of these bearing plates. CB&I provided the plates with the required finish; however, it was necessary to remachine the plates to adjust the thickness to suit the field conditions. Bingham Willamette, under purchase order from Joint Venture, machined the plates to the required thickness, but the 125 MU surface finish was not achieved. Joint Venture's Audit Report indicated the surface finish varied from 200 MU to 650 MU.

Inspection Deficiency:

In the Certificate of Compliance, Bingham Willamette certified the plates but excluded the surface finish requirements. A Joint Venture auditor, who audited the shop documents, pointed out in his audit report that the surface finish varied from 200 MU to 650 MU and the plates did not have the surface finish required by the purchase order.

The Joint Venture was aware of the questionable surface finish on these plates as shipped from Bingham Willamette and was prepared to rework the plate surfaces at the site if necessary. However, the Joint Venture receiving inspector, using surface plate comparative methods, judged the surface finish as received to be in compliance with the purchase order requirements and the bearing plates were released and installed without rework at the site. The Joint Venture's Receiving Inspection Report indicates that the Bingham Willamette Certificate of Compliance was verified and accepted. However, Bingham Willamette's exception to surface finish requirement in the Certificate of Compliance was not addressed in the Receiving Inspection Report.

B. SAFETY ANALYSIS

The steam generator is connected to Primary and Secondary Coolant Loop piping. These piping systems are designed for a fixed rate of temperature and pressure changes during heat up and cool down cycles. Temperature change and pressure limits are established to assure consistency with the design number of cycles and satisfy applicable stress limits in the components of the Coolant System.

Interface temperatures vary at the primary and secondary system sides. The thermal expansion of the individual components is designed to be related to 1½" thermal expansion of the Primary Coolant System during hot function. Hence, to accommodate this thermal expansion the sliding surface for the steam generator is very important.

Frictional resistance of the bearing plate is important to the sliding motion of the Steam Generator. The coeificient of friction, between the bearing plates and the sliding base bearings considered in the CE design of the system is based on a 125 MU surface finish of the bearing plates. If a rougher surface finish is provided, then the coefficient of friction will increase. This will increase the frictional resistance to the sliding motion of the steam generator, thereby inhibiting the system from attaining the design intended thermal expansion and this, in turn, will induce additional stresses in both primary and secondary coolant system components. This could adversely affect the design integrity of the entire system and could also adversely affect the safe operation of the plant.

Since the Combustion Engineering (CE) analysis for steam generator sliding is based on a 125 MU finish, any adverse affects due to varying rougher finish on the sliding surface are indeterminate.

C. CORRECTIVE ACTIONS

The following actions were taken to correct the deficiency:

1. Steam Generator #2 was lifted and the four questionable bearing plates were replaced with four new bearing plates having 125 MU surface finish in accordance with design requirements.

   The four removed bearing plates were inspected by Pacific Testing Laboratory of Seattle, Washington. Two plates were found to meet 125 MU surface finish. Third one varied from 86.5 MU to 245 MU. Fourth one varied from 152.5 to 418.5 MU.

2. Joint Venture revised their Receiving Inspection Procedure to include the verification of all related documentation at the time of receiving inspection.