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VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION
P. O. BOX 402
MINERAL, VIRGINIA 23117

10 CFR 50.73

January 21, 1992

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

Serial No. N-91-034
NAPS:WCH
Docket No. 50-338
License No. NPF-4

Dear Sirs:

The Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Unit 1.

Report No. 50-338/91-022-00

This Report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Corporate Management Safety Review Committee for its review.

Very Truly Yours,

O. E. Kane
Station Manager

Enclosure:

cc: U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

Mr. M. S. Lesser
NRC Senior Resident Inspector
North Anna Power Station

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NRC FORM 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
North Anna Power Station Unit 1	0 5 0 0 0 3 3 8	1 OF 4

TITLE (4)
UNIT SHUTDOWN DUE TO INDETERMINATE STATUS OF STEAM GENERATORS FOLLOWING EDDY CURRENT DATA RE-REVIEW

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
1 2	2 3	9 1	9 1	0 2 2	0 0	0 1	2 1	9 2		0 5 0 0 0
										DOCKET NUMBER(S) 0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
G. E. Kane, Station Manager	AREA CODE 7 0 3 8 9 4 - 2 1 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On December 23, 199', at 1717 hours, a Unit 1 shutdown from 100 percent power (Mode 1) was initiated by management when the operability status of the Steam Generators was called into question. A re-review of the Steam Generator eddy current data taken during the last refueling outage was performed per NRC request to support Unit 1 operation until April 1992. During the review, several indications were identified which could possibly be defects in the tubes. The condition of several tubes could not be determined using the criteria of the re-review; therefore, the unit was shutdown. A Notification of Unusual Event was declared at 1632 hours on December 23, 1991, in accordance with Emergency Plan Implementing Procedures and was terminated on December 24, 1991, at 0730 hours when the unit safely reached cold shutdown. This event is reportable pursuant to 10 CFR 50.73 (a)(2)(i)(A).

The cause of the event was the indeterminate status of the Unit 1 Steam Generators as a result of the eddy current re-review.

This event posed no significant safety implications because the Steam Generator tube integrity was maintained, there were no radiological releases associated with the normal shutdown, and the additional potential defects were bounded by the existing RG 1.121 safety analysis model. Therefore, the health and safety of the general public was not affected at any time during this event.

1.0 Description of the Event

On December 23, 1991, at 1717 hours, a Unit 1 shutdown from 100 percent power (Mode 1) was initiated by management when the operability status of the Steam Generators (EIIS System Identifier AB, Component Identifier HX, Vendor Identifier W120) was called into question. A re-review of the Steam Generator eddy current data taken during the last refueling outage was performed per NRC request to support Unit 1 operation until April 1992. During the review, several indications were identified which could possibly be defects in the tubes. The condition of several tubes could not be determined with certainty, therefore, the unit was shutdown with no abnormal occurrences during the process. A Notification of Unusual Event was declared at 1632 hours on December 23, 1991, in accordance with Emergency Plan Implementing Procedures and was terminated on December 24, 1991, at 0730 hours when the unit reached cold shutdown. This event is reportable pursuant to 10 CFR 50.73 (a)(2)(i)(A).

2.0 Significant Safety Consequences and Implications

This event posed no significant safety implications because the Steam Generator tube integrity was maintained, there were no radiological releases associated with the normal shutdown, and the additional potential defects were bounded by the existing RG 1.121 safety analysis model. Therefore, the health and safety of the general public was not affected at any time during this event.

3.0 Cause of the Event

On December 10, 1991, the NRC requested that Virginia Power re-review the data obtained during Steam Generator eddy current examinations performed during the previous refueling outage. This request was based on indications identified during the examination of a tube which had been pulled from the "B" Steam Generator. When the extracted tube was examined, additional flaws were found which were not identified by the eddy current data analysis. During the re-review of eddy current data, additional potential defects were identified.

During the previous refueling outage when eddy current examinations were performed at the support plates, three different probes were utilized. A bobbin probe was used to inspect tubes from the hot leg tube sheet, over the U-bend region, to the cold leg tube sheet. This probe is primarily sensitive to axial indications. The second probe used was the 8X1 probe which was used on the hot leg side up to the seventh support plate in 100% of the available tubes in the "B" Steam Generator. A sample of tubes in "A" and "C" Steam Generators were inspected up to the seventh support plate (hot leg side) using the 8X1 probe, and the remainder of available tubes were inspected up to the fourth support plate (hot leg side). The probe data screened by the analysts is the resultant of two base signal frequencies which are mixed to enhance

3.0 Cause of the Event (continued)

detection capability. The resulting frequency mix is commonly used throughout the industry for eddy current examinations. The data analyst examined the mixed mode signal and identifies potential indications as "calls". The analyst then reconciled the "call" by reviewing one frequency at a time to identify a correlation between the signals. If no signal correlation existed, the analyst determined that there is no detectable defect (NDD). When potential defects are confirmed, then it is still uncertain whether the indication is a flaw or a buildup of deposits on the outside of the tube. Other invalid indications result from the probe sensing the discontinuity of the tube diameter at the support plates known as tube denting.

In order to disposition invalid indications, a third probe is used. The rotating pancake coil (RPC) probe is sensitive to both circumferential and axial indications. The RPC probe is useful because it characterizes indications and aids in the determination of whether "calls" are valid; however, the RPC inspection is a much slower process than the 8X1 or bobbin. For this reason, the RPC detectors are primarily used to confirm or dismiss "calls" that were made using the 8X1 and bobbin probes.

When the data obtained from the previous inspections was re-reviewed, the analysis used more conservative guidelines. They were directed to "call" any signal with a vertical voltage component even if the signal was not in the traditional flaw plane. Additionally, they were directed to make calls without correlation from a base frequency. These two additional conservatisms were added to the 1991 rule base as a result of industry experience since the 1991 outage of Unit 1. Data obtained from approximately 300 tubes and previously determined as NDD with the 8X1 probe was re-reviewed. Twenty calls were made based on indications identified using the revised rules. When the original 1991 rule base was applied to these 20 indications, frequency correlation was obtained for some of these indications.

RPC data obtained from 433 tube support plate intersections which had previously been determined to be NDDs were also re-reviewed, and 29 calls were made using the new guidelines.

Due to the known condition of the Unit 1 Steam Generators, the conservative assumption was made that some of the additional calls were defects in excess of 40% of the nominal tube wall thickness. After detailed discussions with the NRC, the Steam Generators were declared inoperable based on the requirements of TS 3.4.5.

4.0 Immediate Corrective Actions

Following determination that the operability if the Steam Generators was in question, a unit shutdown was commenced in accordance with TS 3.0.3.

4.0 Immediate Corrective Actions (continued)

A Notification of Unusual Event (NOUE) was declared in accordance with the Emergency Plan Implementing Procedures.

At 0730 hours on December 24, 1991, the unit was successfully shutdown, and the NOUE was terminated.

5.0 Additional Corrective Actions

A comprehensive eddy current inspection plan was developed which features additional inspection activities and a more conservative rule base than previous inspections.

Tubes requiring plugging will be plugged. Finally, a safety analysis will be performed to verify full compliance with RG 1.121 prior to unit startup.

6.0 Actions to Prevent Recurrence

The additional inspections will utilize the bobbin, 8X1 and RPC probes, and all indications will be dispositioned prior to unit startup.

All three Unit 1 Steam Generators are scheduled to be replaced during the January 1993 refueling outage.

7.0 Similar Events

None.

8.0 Additional Information

North Anna Unit 2 was in Mode 1 throughout this event and was not affected.