

LICENSEE EVENT REPORT (LER)

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

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)
0 8	0 2	8 4	8 4	0 0 7	0 0	0 8	3 0	8 4			0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9) 6

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

20.402(b)	20.406(c)	50.73(a)(2)(iv)	73.71(b)
20.406(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.406(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

POWER LEVEL (10) 0 0 0

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
E. Wayne Harrell	AREA CODE 7 0 3 8 9 4 - 5 1 5 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS
X		X   X   X   K	W   1   2   0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

ABSTRACT

During the spring 1984 Unit 1 refueling outage, the Cycle 4 fuel assemblies (NIC4) were examined for possible leakage. Of the 157 assemblies, 17 were determined to be leaking based on sipping examinations. Subsequent high magnification visual examination of the 17 assemblies indicated that two (2) fuel assemblies exhibited missing top end plugs, two (2) assemblies exhibited through wall fretting defects and one (1) exhibited a hydride blister defect. An evaluation of the fuel failures is in progress but not completed. Based on preliminary visual evaluation, possible failure mechanisms are primary hydriding, debris induced fretting, weld defects, and stress related defects.

Baffle jetting has been ruled out as a failure mechanism. The Cycle 5 core was redesigned and all leaking assemblies from Cycle 4 which were intended for reload into Cycle 5 were replaced. All assemblies reused in Cycle 5 underwent a precautionary cleaning process to eliminate debris. This report is being submitted as a voluntary report.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		8   4	-   0   0   7	-   0   0	0   2	OF 0   3

TEXT (If more space is required, use additional NRC Form 368A's) (17)

1. Description of the Event

Due to fuel failure indications during Unit 1, Cycle 4 (N1C4) operation, a thorough fuel examination and evaluation program was undertaken. The examination portion of the program has been completed. The initial examinations (Phase A) were performed prior to Cycle 4 off-load and consisted of sipping examinations, using the General Electric vacuum sipping system, of 28 fuel assemblies which were in the spent fuel pool. These assemblies were either scheduled for reuse in Cycle 5 or were available to replace failed N1C4 assemblies. The Phase B examinations began after Cycle 4 off-load and consisted of 1) binocular visual examination of all 157 N1C4 assemblies, 2) sipping of 126 assemblies in N1C4 which were scheduled for use in N1C5 or were available as replacement assemblies, 3) high magnification visual examination of assemblies and 4) debris cleaning of all fuel assemblies scheduled for reuse in the redesigned N1C5 core. The Phase C examinations, which were performed after Cycle 5 on-load, consisted of 1) sipping of 31 assemblies discharged from N1C4 and not considered for reuse in Cycle 5, 2) high magnification video inspection of fuel assemblies known to be failed and 3) debris cleaning of N1C4 assemblies which might be used in future cycles.

The Phase A sipping of twenty-eight assemblies in the spent fuel pit resulted in the detection of two leaking assemblies. These two assemblies were last utilized in N1C3.

Phase B sipping resulted in the detection of fifteen failed assemblies (6 Batch 6 and 9 Batch 5). Fifty fuel assemblies (15 failed and 35 non-failed) were examined with high magnification video below Grid 1. Of the fifteen leakers, eight exhibited debris, debris and fretting, or fretting and 7 exhibited no visible anomalies below Grid No. 1. Of the 35 non-leakers 5 exhibited debris, and 30 exhibited no anomalies. Based on these observations, it was decided as a precautionary measure to inspect for and remove any debris found in 89 assemblies scheduled for reuse in the redesigned Cycle 5 core. As a result of this cleaning procedure, debris removal from 21 assemblies was visually observed.

In addition, all the baffle assemblies adjacent to center, corner or combination joints were examined by high magnification TV for the presence of baffle jetting failures. No baffles jetting failures were observed although slight baffle spray crud patterns were observed on several assemblies.

As a result of the Phase C sipping, two additional leakers were found in the discharged assemblies. Twenty-five (25) assemblies were examined with high magnification TV during Phase C. Of the 25 assemblies, 19 (seventeen from N1C4 and two from N1C3) were leakers and 6 were non-leakers. Of the 17 leakers from N1C4, two had missing end plugs, one had a cracked end plug, one had an open hydride blister and 9 had a combination of fretting, debris and fretting or debris. The two N1C3 leakers both contained small pieces of debris. In addition to the video inspections which were performed during Phase C examinations, 40 more non-leaking previously sipped assemblies (31 from N1C4 and 9 from N1C3) were subjected to a debris cleaning process.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

2. Probable Consequences and Status of Redundant Equipment

During steady state power operations, specific activity of the RCS remained below maximum levels specified in the Technical Specifications. During refueling operations, the containment and fuel building ventilation continually exhaust through the Category I iodine filters. Therefore, the health and safety of the public have not been affected.

3. Cause

A thorough evaluation of the fuel failures is in progress but has not been completed. However, based on the sipping and video examinations possible failure mechanisms are primary hydriding, debris induced fretting, re i defects and stress related defects. Based on the examinations, baffle jettang has been ruled out as a failure mechanisms.

4. Immediate Corrective Action

Cycle 4 fuel assemblies that were determined to be leaking and intended for reuse in Cycle 5, were eliminated from the Cycle 5 core design. In addition, each assembly which was reused in the Cycle 5 core was subjected to a precautionary debris cleaning process. Also, portions of the RCS were cleaned.

5. Subsequent Corrective Action

It is not planned to use any of the fuel identified as leakers in subsequent fuel cycles.

6. Action Taken to Prevent Recurrence

In addition to RCS cleanup, final examinations, and precautionary fuel cleaning, VEPCO is conducting a detailed review of the rod design specifications and manufacturing process used by Westinghouse in order to determine if they are conservative enough to reduce the possibility of design and manufacturing related defects in the future.

7. Generic Implications

Manufacturing and debris related failures have been observed at other power stations.

# Vepco

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION

P. O. BOX 402

MINERAL, VIRGINIA 23117

August 30, 1984

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

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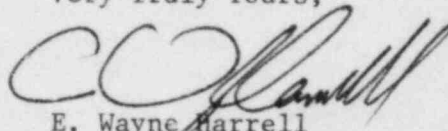
Dear Sirs:

The Virginia Electric and Power Company hereby submits the following License Event Report applicable to North Anna Unit No. 1.

Report No. LER 84-007

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to Safety Evaluation and Control for their review.

Very Truly Yours,



E. Wayne Harrell  
Station Manager

Enclosures (3 copies)

cc: Mr. James P. O'Reilly, Regional Administrator  
U. S. Nuclear Regulatory Commission  
Region II  
101 Marietta Street, Suite 2900  
Atlanta, Georgia 30303

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