

**Virginia Electric and Power Company
North Anna Power Station
1022 Haley Drive
Mineral, Virginia 23117**

July 1, 2021

Attention: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Serial No.: 21-186
NAPS: CNC
Docket Nos.: 50-338
License Nos.: NPF-4

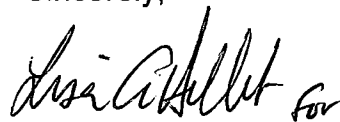
Dear Sir or Madam:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Power Station Unit 1.

Report No. 50-338/2021-001-00

This report has been reviewed by the Facility Safety Review Committee and will be forwarded to the Management Safety Review Committee for its review.

Sincerely,



Fred Mladen
Site Vice President
North Anna Power Station

Enclosure

Commitments contained in this letter: None

cc: United States Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

NRC Senior Resident Inspector
North Anna Power Station

TEZZ
NRR



LICENSEE EVENT REPORT (LER)

(See Page 3 for required number of digits/characters for each block)
(See NUREG-1022, R.3 for instruction and guidance for completing this form
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollect.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk all: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name North Anna Power Station, Unit 1	2. Docket Number 05000	3. Page 1 OF 3
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4. Title
Manual Reactor Trip on Degrading Condenser Vacuum Due to Piping Failure

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Revision No.	Month	Day	Year	Facility Name	Docket Number
05	06	2021	2021	- 001 -	00	07	01	2021		05000
									Facility Name	Docket Number
										05000

9. Operating Mode 1	10. Power Level 060
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11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)

<input type="checkbox"/> 10 CFR Part 20	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.36(c)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	10 CFR Part 73
<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.69(g)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(4)
<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.71(a)(5)
<input type="checkbox"/> 20.2203(a)(2)(i)	10 CFR Part 21	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(1)(i)
<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 21.2(c)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(i)
<input type="checkbox"/> 20.2203(a)(2)(iii)	10 CFR Part 50	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 73.77(a)(2)(ii)
<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)	

OTHER (Specify here, in abstract, or NRC 366A).

12. Licensee Contact for this LER

Licensee Contact Fred Mladen, Site Vice President	Phone Number (Include area code) (540) 894-2101
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13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to IRIS	Cause	System	Component	Manufacturer	Reportable to IRIS
B	SN	PSP		Y					

14. Supplemental Report Expected

<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date)	15. Expected Submission Date <table border="1" style="float:right; width:100px"> <tr> <th>Month</th> <th>Day</th> <th>Year</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	Month	Day	Year			
Month	Day	Year					

16. Abstract (Limit to 1560 spaces, i.e., approximately 15 single-spaced typewritten lines)

On May 6, 2021 at 1223 hours, Unit 1 was manually tripped from 60% power due to degrading main condenser vacuum. Unit 1 was in the process of decreasing power due to increased secondary sodium levels identified earlier in the day. At 1400 hours on May 6, 2021, a 4-hour and 8-hour non-emergency report was made per 10 CFR 50.72(b)(2)(iv)(B) for RPS Actuation (scram) and 10 CFR 50.72(b)(3)(iv)(A) for a valid actuation of an ESF system, respectively.

The direct cause of the event was High Cycle Fatigue Piping Failure of the "A" High Pressure Heater Drain Receiver High Level Divert Line that caused damage to condenser tubes and degraded condenser vacuum. Unit 2 continued to operate at 100% power, Mode 1, during the event. The health and safety of the public were not affected by this event.

**LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET**

(See NUREG-1022, R.3 for instruction and guidance for completing this form
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1. FACILITY NAME North Anna Power Station	2. DOCKET NUMBER 05000- 338	3. LER NUMBER		
		YEAR 2021	SEQUENTIAL NUMBER - 001	REV NO. - 00

NARRATIVE

1.0 Description of Event

On May 6, 2021 at 0900 hours with Unit 1 and Unit 2 in Mode 1, 100% power, North Anna Unit 1 exceeded the Action Level 3 for Secondary Chemistry as identified in 0-CH-99.600 (Secondary Chemistry Specifications and Action Levels) and began an orderly shutdown using 1-OP-2.2 (Unit Power Operations from Mode 1 to Mode 2). During the ramp, procedure 1-MOP-48.30 (Main Condenser – "A" Waterbox) was in progress to isolate the "A" Condenser Waterbox (EIS Component COND, System SG) due to suspected tube leakage. When the waterbox was isolated, a degradation of condenser vacuum was identified on May 6, 2021 at 1219, and the control room team entered 1-AP-14 (Low Condenser Vacuum). On May 6, 2021 at 1223, while in 1-AP-14 at 60% reactor power, the crew initiated a manual reactor trip based on previous briefings and contingencies established when the decision was made to isolate the "A" Condenser Waterbox. At 1400 hours on May 6, 2021, a 4-hour and 8-hour non-emergency report was made per 10 CFR 50.72(b)(2)(iv)(B) for RPS Actuation (scram) and 10 CFR 50.72(b)(3)(iv)(A) for a valid actuation of an ESF system, respectively.

A broken pipe cap in the "A" Condenser from the "A" High Pressure Heater Drain Tank High Level Divert Line (EIS Component PSP, System SN) was identified. This pipe cap damaged tubing in the "G" section of the tube bundle in the "A" Condenser Waterbox. This tube damage allowed air ingress when the "A" Condenser Waterbox was isolated, which caused the degrading vacuum.

Following the Unit 1 trip, the Unit 1 "A", "B", and "C" MSR Flow Control Valves (EIS Component FCV, System SN), 1-MS-FCV-104A/B/C, indicated mid position with the associated control switch in the CLOSED position, with controller demand at 0%. The limit switches were adjusted/repared without issues. Additionally, one of the two Intermediate Range Nuclear Instruments (NI), N-36 (EIS Component DET, System IG), was found to be under compensated during the reactor shutdown.

2.0 Significant Safety Consequences and Implications

No significant safety consequences resulted from this event. Unit 1 was promptly removed from service and all Engineered Safety Feature equipment responded as designed. The affected pipe cap was repaired, and damaged condenser tubes were plugged. The health and safety of the public were not affected by this event.

3.0 Cause of the Event

The direct cause of the event was High Cycle Fatigue Piping Failure of 1-SD-TK-1A, "A" High Pressure Heater Drain Receiver High Level Divert Line (EIS Component PSP, System SN), that caused damage to condenser tubes and degraded condenser vacuum. Contributing to this failure was high level divert line design and piping orientation and craftsmanship on the flat pipe cap end plate weld. Additionally, there was insufficient procedural guidance on performing detailed inspections on the High Pressure Heater Drain Receiver High Level Divert Lines.

4.0 Immediate Corrective Action

The immediate corrective action included inspecting and repairing the failed "A" High Pressure Heater Drain Receiver High Level Divert Line. Additionally, the Unit 1 Main Condenser tubes affected by the High Level Divert Line failure in the "A" Condenser Waterbox were inspected and repaired.

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North Anna Power Station	05000- 338	2021	- 001	- 00

NARRATIVE

5.0 Additional Corrective Actions

Extent of condition inspections and repairs performed on similar Unit 1 lines 12-WDRD-1-301 (1-SD-TK-2B High Level Divert Line - EIS Component PSP, System SN) and 12-WDRD-5-301 (1-SD-TK-2C High Level Divert Line - EIS Component PSP, System SN) revealed cracking in the same failed locations as on the Unit 1 "A" High Level Divert Line. The Unit 1 "B" High Level Divert Line was replaced, and the Unit 1 "C" High Level Divert Line was repaired. Work has been scheduled to perform extent of condition inspections and repairs on equivalent Unit 2 piping at the next available opportunity.

6.0 Actions to Prevent Recurrence

The condenser inspection procedure is being revised to ensure that any cracking of the Unit 1 and Unit 2 High Pressure Heater Drain Receiver High Level Divert Lines is identified at an early enough stage such that repairs can be made prior to a similar failure occurring. Piping analysis will be performed to determine if any future operational limitations are required for the piping system.

7.0 Similar Events

A similar event occurred previously at North Anna on 3/2/2019. Degraded condenser vacuum was observed on Unit 2 during a scheduled power reduction for a refueling outage and the reactor was manually tripped. The direct cause of the degrading condenser vacuum in 2019 was a failed socket weld downstream of a High Pressure Turbine Main Steam Supply Header Drain Valve on the condenser (steam) side. This was reported by LER 2019-001-00, dated 4/26/2019.

8.0 Additional Information

Unit 2 continued to operate at 100% power, Mode 1 during this event.