

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

June 3, 2020

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

Serial No.: 20-198  
NAPS: RAP  
Docket Nos.: 50-339  
License Nos.: NPF-7

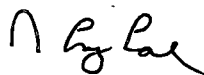
Dear Sir or Madam:

Pursuant to 10CFR50.73, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Power Station Unit 2.

Report No. 50-339/2020-001-00

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,



N. Larry Lane  
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

IEZZ  
NRR



## LICENSEE EVENT REPORT (LER)

(See Page 2 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 Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to [infocollections.Resource@nrc.gov](mailto:infocollections.Resource@nrc.gov), and the OMB reviewer at OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk-Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: [oir\\_submission@omb.eop.gov](mailto: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	2. Docket Number 05000339	3. Page 1 OF 3
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4. Title Technical Specification Required Shutdown due to Reactor Coolant System Pressure Boundary Leakage
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5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
04	09	2020		2020-001-00		06	03	2020	Facility Name	Docket Number 05000

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: (Check all that apply)			
1	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
10. Power Level	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
100%	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> 73.77(a)(1)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> 73.77(a)(2)(i)
	<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 73.77(a)(2)(ii)
		<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER	
Licensee Contact N. Larry Lane	Telephone Number (Include Area Code) (540) 894-2101

13. Complete One Line for each Component Failure Described in this Report										
Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES	
B	CB	PSX		Y						

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
<input type="checkbox"/> Yes (If yes, complete 15. Expected Submission Date) <input checked="" type="checkbox"/> No				

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

On April 6, 2020 at 0037 hours with Unit 1 and Unit 2 in Mode 1, 100% power, Reactor Coolant System (RCS) unidentified leak rate increased from 0.0247 gallons per minute (gpm) to 0.1081 gpm. Multiple containment entries were made to identify the cause of the increase in unidentified leakage. On April 9, 2020 at 0100 hours a RCS pressure boundary leak was identified on the Unit 2 "A" Reactor Coolant Pump (RCP) seal injection piping to its thermal barrier. At 0123 hours on April 9, 2020, operators began a controlled down power in accordance with station operating procedures to take Unit 2 offline and place it in Mode 5, Cold Shutdown conditions. While in Mode 5, the seal injection line welded connection to the "A" RCP was repaired. At 0337 on April 9, a 4-hour non-emergency report was made per 10 CFR 50.72(b)(2)(i) for "Initiation of plant shutdown required by Technical Specifications" and 10 CFR 50.72(b)(3)(ii)(A) for "Any event or condition that results in the condition of the nuclear power plant, including its principle safety barriers, being seriously degraded." Unit 1 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  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/>)

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1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
North Anna Power Station	05000- 339	2020	- 001	- 00

**NARRATIVE****1.0 Description of Event**

On April 6, 2020 at 0037 hours with Unit 1 and Unit 2 in Mode 1, 100% power, an increase in containment sump pumping frequency was identified by the operating crew. At 0131 hours, the operating crew entered 2-AP-16, "Increasing Primary Plant Leakage" due to an increase in Reactor Coolant System (RCS) (EIS System AB) unidentified leakage from 0.0247 gallons per minute (gpm) to 0.1081 gpm. Total RCS leakage had risen from approximately 0.2 gpm to 0.2881 gpm. Multiple containment entries were made by plant personnel until the source of the leakage was identified.

At 0100 on April 9, 2020, the RCS leakage source was identified on the Unit 2 "A" Reactor Coolant Pump (RCP), 2-RC-P-1A, (EIS Component P, System AB) seal injection (EIS System CB) piping to its thermal barrier. The leakage was visually confirmed to be RCS pressure boundary leakage. At that time, Condition B of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.4.13, "RCS Operational Leakage" was entered. TS 3.4.4 "RCS Loops – Mode 1 and 2" and Technical Requirement 3.4.6 "ASME Code Class 1, 2, and 3 Components" were also applicable. At 0123 hours on April 9, 2020, operators began a controlled down power in accordance with station operating procedures to take Unit 2 offline and place it in Mode 5, Cold Shutdown conditions. At 0337 on April 9, a 4-hour non-emergency report was made per 10 CFR 50.72(b)(2)(i) for "Initiation of plant shutdown required by Technical Specifications" and 10 CFR 50.72(b)(3)(ii)(A) for "Any event or condition that results in the condition of the nuclear power plant, including its principle safety barriers, being seriously degraded."

During the reactor shutdown and after Unit 2 had been taken offline, a Main Steam Moisture Separator Reheater (EIS Component MSR, System SB) inlet flow control valve (EIS Component FCV) failed to close when removing the MSRs from service as directed by station operating procedures. The valve was closed locally. Additionally, one of the two Intermediate Range Nuclear Instruments (NI), N-35 (EIS Component DET, System IG), was found to be under compensated during the reactor shutdown. As a result, the Source Range NIs had to be manually energized and N-35 was declared inoperable.

This event is reportable per 10 CFR 50.73 (a)(2)(i)(A) for "Completion of any nuclear plant shutdown required by the plant's Technical Specifications" and 10 CFR 50.73 (a)(2)(ii)(A) for "Any event or condition that resulted in a condition of the nuclear power plant, including its principal safety barriers, being seriously degraded."

**2.0 Significant Safety Consequences and Implications**

No significant safety consequences resulted from this event. Unit 2 was promptly removed from service and the affected seal injection piping weld connection was repaired for 2-RC-P-1A. The health and safety of the public were not affected by this event.

**3.0 Cause of the Event**

The cause(s) of the identified RCP seal injection line leak on 2-RC-P-1A has been attributed to a combination of initial weld quality, elevated nozzle loads, lack of conservatism in weld joint detail, and stresses induced by system vibration. The combination of these four (4) causes resulted in high cycle fatigue and cracking of the welded joint connection between the seal injection line and the RCP thermal barrier.

**4.0 Immediate Corrective Action**

The immediate corrective action included grinding out the defect (crack) from the weld and base metal. This grinding evolution removed the entirety of the crack and provided a new base for the repair weld. A partial repair weld was successfully completed. Visual and liquid penetrant inspections were performed prior to and during the grinding evolution

to determine the depth and extent of the crack to be repaired.

#### **5.0 Additional Corrective Actions**

During the next refueling outage, a non-destructive examination (NDE) volumetric inspection of 2-RC-P-1A seal injection to thermal barrier weld will be performed, the pipe support system for the 2-RC-P-1A seal injection line will be evaluated to reduce nozzle loading, revise the modified weld details of RCP seal injection to thermal barrier welds to ensure the weld type, characteristics, and geometry are maintained, and the applicable documents updated.

#### **6.0 Actions to Prevent Recurrence**

An NDE Volumetric Inspection Program of the thermal barrier piping weld joints will be implemented until the welds are modified to the Westinghouse enhanced weld joint detail. The NDE Volumetric Inspection Program will be implemented during the next Unit 1 and Unit 2 refueling outages.

#### **7.0 Similar Events**

Similar events have occurred previously at North Anna. In 2016, RCS pressure boundary leakage was identified on the Unit 2 "C" RCP seal controlled leak-off line and was reported by LER 2016-001-00, dated September 21, 2016. Additionally, in 1994, RCS pressure boundary leakage was identified from the seal injection weld on the Unit 2 "B" RCP. This was reported by LER 1994-005-00, dated June 24, 1994.

#### **8.0 Additional Information**

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