

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) NORTH ANNA POWER STATION, UNIT 2	DOCKET NUMBER (2) 050003319	PAGE (3) 1 OF 016
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TITLE (4)
INADVERTENT ESF ACTUATION DURING MAINTENANCE

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)
05	04	88	88	003		05	25	88			05000
											05000

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

OPERATING MODE (9) 1	20.402(b)	20.405(c)	<input checked="" type="checkbox"/>	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 365A)
	20.405(a)(1)(iii)	<input checked="" type="checkbox"/>	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 G. E. Kane, Station Manager	TELEPHONE NUMBER 710 389 4151
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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

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)

At 1104 hours on May 4, 1987, with Unit 2 at 100 percent power, an inadvertent partial train "B" Engineered Safety Features (ESF) actuation of the Containment Depressurization System occurred. As a result of prompt operator action and the specific equipment configuration, an actual Containment Spray did not occur. This event is reportable pursuant to 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(iv). A four hour report was made in accordance with 10CFR50.72(b)(2)(ii).

The actuation occurred when a ground was introduced into the Solid State Protection System during valve maintenance. As a corrective action, the Control Room operators verified that the actuation was spurious, performed the necessary actions to enable resetting the actuation signal, and successfully reset the actuation signal. To prevent recurrence of similar events, applicable procedures will be reviewed and revised as necessary to include additional cautions and notes and require the use of insulated tools when working in switches, boxes, etc.

No significant safety consequences resulted from this event because an actual Containment Spray did not occur. Also, equipment actuations were verified to have actuated per design and were subsequently restored to their normal configuration. The health and safety of the general public was not affected at any time during this event.

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

1.0 Description of Event

At 1104 hours on May 4, 1987, with Unit 2 at 100 percent power, an inadvertent partial train "B" Engineered Safety Features (ESF) (EIIS System Identifier) actuation of the Containment Depressurization System (EIIS System Identifier) occurred. The actuation occurred when a ground was introduced into the Solid State Protection System (SSPS) (EIIS System Identifier) during valve maintenance. As a result of prompt operator action and the specific equipment configuration, an actual Containment Spray did not occur. This event is reportable pursuant to 10CFR50.73(a)(2)(iv) and 10CFR50.73(a)(2)(i)(B) since Technical Specification 3.0.3 was entered when both Train "B" Recirculation Spray pumps were placed in "Pull to Lock". A four hour report was made in accordance with 10CFR50.72(b)(2)(ii).

Prior to this event, maintenance was being performed on MOV-QS-200B, a Train "B" Quench Spray (QS) valve (EIIS System Identifier, Component Identifier) located on the suction side of the Train "B" QS pump (2-QS-P-1B).

During the performance of a limit switch adjustment on MOV-QS-200B, the SSPS output relay K643 was energized. Review of station drawings revealed that a limit switch on MOV-QS-200B provided an interlock to a test circuit associated with relay K643. This limit switch allows K643 to be tested only when MOV-QS-200B is closed and is normally at a 120VAC potential relative to the SSPS. The coil of K643 is in series with the limit switch. Therefore, grounding the limit switch energizes the relay. When a partially insulated screwdriver shaft came in contact with the interlocking limit switch, the circuit was completed, and relay K643 was energized because the tip of the screwdriver was at ground potential. When relay K643 was energized, it actuated two other output relays, K643XB1 and K643XB2. As a result, the following ESF actuations occurred:

- o Service Water (EIIS System Identifier) flow was initiated to the four Recirculation Spray Heat Exchangers (EIIS System Identifier, Component Identifier).
- o Approximately 800 gallons of borated water was sluiced from the RWST to the Containment Recirculation Spray Sump (EIIS System Identifier, Component Identifier) through an idle Train "B" QS pump. (NOTE: This quantity of water posed no operational problems and was easily removed by normal containment sump pump operation.)
- o The Safeguards Ventillation System dampers (EIIS System Identifier, Component Identifier) shifted to redirect flow from the normal vent path to the iodine filter.

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- ° Service Water flow was isolated to the Unit 2 Component Cooling Water Heat Exchangers (EIIS System Identifier , Component Identifier).
- ° The 2J Emergency Bus Stub Bus Breaker (EIIS System Identifier , Component Identifier) tripped. (There were no loads on the stub bus.)

Upon receiving an annunciator alarm, the Control Room Operators verified normal indication of containment pressure on the four containment pressure protection channels and unsuccessfully attempted to reset the actuation signal. To prevent inadvertent starting of the Inside and Outside Recirculation Spray pumps after a time delay and subsequent pump damage, the operators placed both Train "B" Recirculation Spray Pumps in the "Pull to Lock" position. After the operators notified the electricians to stop working on MOV-QS-200B, relay K643 was successfully reset. It is believed that earlier attempts to reset relay K643 were unsuccessful because the uninsulated screwdriver was in contact with the interlocking limit switch at the time the reset was attempted.

Equipment was restored to the normal configuration by approximately 40 minutes after the ESF actuation was initiated. Actuations that occurred were verified to have occurred per design (see Attachment 1).

2.0 Significant Safety Consequences and Implications

No significant safety consequences resulted from this event because an actual Containment Spray did not occur. Also, equipment actuations were verified to have actuated per design and were subsequently restored to their normal configuration. The health and safety of the public were not affected at any time during this event.

3.0 Cause of the Event

The partial ESF actuation occurred when a ground was introduced into the Solid State Protection System (SSPS) and actuated an output relay. The ground resulted when a partially insulated metal screwdriver came in contact with a limit switch which is normally at a 120 VAC potential relative to the SSPS and is in series with the coil of the output relay.

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4.0 Immediate Corrective Action

As an immediate corrective action, the Control Room operators verified normal indication of containment pressure on the four containment pressure protection channels and reset the ESF actuation signal.

5.0 Additional Corrective Action

Following the event, a Significant Event Review meeting was held with station management and the individuals involved in the event. As a result of this meeting, the following additional corrective actions were performed:

- The maintenance procedure was deviated to insert a caution to insulate the adjustment tool and maintenance was satisfactorily completed on MOV-QS-200B at 2147 hours.
- The amount of water sluiced from the RWST was quantified and the flowpath was verified to be through the idle quench spray pump 2-QS-P-1B and down a 4 inch orifice line to the recirculation spray sump.

The following additional corrective actions will be performed:

- Operation with the Recirculation Spray Heat Exchanger filled with Service Water is still being evaluated.
- Engineering will perform a review of the adequacy of the circuitry design and determine how many other similar circuits exist.

6.0 Actions to Prevent Recurrence

To prevent recurrence, seven other MOV's with similar interlock design characteristics have been identified. A review has also been initiated to identify any more MOV's and/or devices where safeguards relays or other safeguard equipment could be actuated. Upon identification, appropriate procedures will be reviewed and revised to include notes/cautions with respect to vital bus power and relay actuation and the potential results of relay actuation.

Additionally, procedures will be revised to require the use of insulated tools and/or other insulating methods when working in switches, boxes, etc.

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

7.0 Similar Events

Previous inadvertent ESF actuations during maintenance/testing are provided below:

<u>Unit 1</u>	<u>Unit 2</u>
84-002-00	84-009-00
84-020-00	87-013-00
85-023-00	87-014-00
86-017-00	87-016-00
87-012-00	87-018-00
87-022-00	

8.0 Additional Information

Unit 1 was in Mode 1 during this event and was not affected.

Operation of the Recirculation Spray Heat Exchangers filled with Service Water has been determined to be reportable pursuant to 10CFR50.73(a)(2)(ii)(B) and will be reported in LER N1/N2-88-016-00.

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ATTACHMENT 1

EQUIPMENT ACTUATION LIST

<u>RELAY</u>	<u>FUNCTION</u>	<u>VERIFIED</u>	<u>EXPLANATION FOR N</u>
K643	Closes MOV-SW-208B	Y	
	Opens MOV-QS-201B	Y	
	Opens MOV-SW-201D	Y	
	Starts 2-RS-P-2B	N	Pump Placed in PTL by Operator
	Opens MOV-SW-205B	Y	
	Energizes K643XB1	Y	
K643XB1	Energizes K643XB2	Y	
	Closes MOV-SW-210B	N	De-energized per Operating Procedure
	Closes MOV-SW-214B	N	De-energized per Operating Procedure
	Energizes Relay 3F	N	Could not Verify, ESF Signal Reset
	Energizes Relay 3N	Y	
	Trips Breaker 15J12 (Stub Bus)	Y	
K643XB2	Closes SOV-HV-228-2	Y	
	Closes SOV-HV-115A-2	Y	
3F	Interlocks MOV-SW-205B	N	Could not Verify, ESF Signal Reset
	Interlocks MOV-SW-208B	N	Could not Verify, ESF Signal Reset
	Interlocks MOV-SW-210B	N	Could not Verify, ESF Signal Reset
	Interlocks MOV-SW-214B	N	Could not Verify, ESF Signal Reset
	Interlocks MOV-SW-201D	N	Could not Verify, ESF Signal Reset
	Blocks Trip 2-RS-P-2B	N	Could not Verify, ESF Signal Reset
3N	Block Close MOV-RS-256B	N	Could not Verify, ESF Signal Reset
	Interlock MOV-QS-210B	N	Could not Verify, ESF Signal Reset
	Trips SPDS File	Y	
	Block Close MOV-RS-255B	N	Could not Verify, ESF Signal Reset

Vepco

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

May 25, 1988

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

Serial No. N-88-021
NO/DEQ: nih
Docket No. 50-339

License No. NPF-7

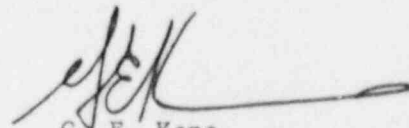
Dear Sirs:

The Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Unit 2.

Report No. LER 88-003-00

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,



G. E. Kane
Station Manager

Enclosure

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

Mr. J. L. Caldwell
NRC Senior Resident Inspector
North Anna Power Station

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