

# REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8711250222 DOC. DATE: 87/11/20 NOTARIZED: NO DOCKET #  
 FACIL: 50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397  
 AUTH. NAME AUTHOR AFFILIATION  
 WASHINGTON, S. L. Washington Public Power Supply System  
 POWERS, C. M. Washington Public Power Supply System  
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 87-025-01: on 870808, ESF isolations & actuations  
 occurred. Caused by spurious trip of breaker due to oxide  
 formation on coil plunger end of undervoltage relay coil.  
 Breakers replaced. W/871120 ltr.

DISTRIBUTION CODE: IE22D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5  
 TITLE: 50.73 Licensee Event Report (LER), Incident Rpt, etc.

## NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	PD5 LA	1 1	PD5 PD	1 1
	SAMWORTH, R	1 1		
INTERNAL:	ACRS MICHELSON	1 1	ACRS MOELLER	2 2
	AEOD/DOA	1 1	AEOD/DSP/NAS	1 1
	AEOD/DSP/ROAB	2 2	AEOD/DSP/TPAB	1 1
	ARM/DCTS/DAB	1 1	DEDRO	1 1
	NRR/DEST/ADS	1 0	NRR/DEST/CEB	1 1
	NRR/DEST/ELB	1 1	NRR/DEST/ICSB	1 1
	NRR/DEST/MEB	1 1	NRR/DEST/MTB	1 1
	NRR/DEST/PSB	1 1	NRR/DEST/RSB	1 1
	NRR/DEST/SGB	1 1	NRR/DLPQ/HFB	1 1
	NRR/DLPQ/QAB	1 1	NRR/DOEA/EAB	1 1
	NRR/DREP/RAB	1 1	NRR/DREP/RPB	2 2
	NRR/DREP/SIB	1 1	NRR/PMAS/ILRB	1 1
	REG FILE 02	1 1	RES DEPY GI	1 1
	RES TELFORD, J	1 1	RES/DE/EIB	1 1
	RGN5 FILE 01	1 1		
EXTERNAL:	EG&G GROH, M	5 5	H ST LOBBY WARD	1 1
	LPDR	1 1	NRC PDR	1 1
	NSIC HARRIS, J	1 1	NSIC MAYS, G	1 1



## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Washington Nuclear Plant - Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 3 9 7										PAGE (3) 1 OF 0 4				
TITLE (4) Engineered Safety Feature Isolations and Actuations Caused By Reactor Protection System Equipment Failure																								
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	8	8	7	8	7	0	2	5	0	1	1	1	2	0	8	7	0 5 0 0 0					
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																						
1		20.402(b)				20.405(c)				<input checked="" type="checkbox"/> 50.73(a)(2)(iv)				73.71(b)										
POWER LEVEL (10)		0 8 5				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)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)										
		20.405(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(vii)(A)														
		20.405(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(vii)(B)														
		20.405(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(x)														
LICENSEE CONTACT FOR THIS LER (12)																								
NAME S.L. Washington, Compliance Engineer												TELEPHONE NUMBER 5 0 9 3 7 7 - 2 0 8 0												
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																								
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS														
X	J C	B K R	G 0 8 0	Y																				
SUPPLEMENTAL REPORT EXPECTED (14)												EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR								
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)												<input checked="" type="checkbox"/> NO												

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

On August 8, 1987 the plant was at 85% power and on a gradual power ascension when, at 1855 hours, a spurious trip of the Reactor Protection System (RPS) Electrical Protection Assembly (EPA) 3A Breaker caused a loss of power to RPS Bus A. The loss of power on RPS Bus A caused a half-scrum in RPS Division A and multiple Engineered Safety Feature (ESF) isolations and actuations.

The loss of RPS A power causes an Outboard Nuclear Steam Supply Shutoff System (NSSSS) isolation of Groups 1 (Main Steam Line Drains only), 2, 4 (two drain valves only) 5, 6, and 7. NSSSS Group 7 isolates the Reactor Water Cleanup System (RWCU). In addition, the loss of RPS A power causes a NSSSS Group 3 (Primary and Secondary Containment Ventilation and Purge Systems) and a partial Group 4 (Miscellaneous Balance of Plant) isolation and Standby Gas Treatment (SGT) System and Control Room Emergency Filtration System actuation.

Plant operators switched RPS Bus A to its alternate power supply and restored all systems to their pre-event lineup within 20 minutes.

The cause of the event was a spurious trip of the RPS-EPA-3A Breaker.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Washington Nuclear Plant - Unit 2	05000397	87	025	01	02	OF 04

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

Abstract (continued)

The cause is attributed to oxide formation on the coil plunger end of the breaker undervoltage relay coil. This oxide formation reduced the magnetic force which holds the coil of the undervoltage relay in its set (activated) position. The root cause is oxide build up thought to be caused by overheating due to excessive design voltage on the coil.

The EPA Breakers will be periodically replaced until the oxide formation problem is resolved.

There is no safety significance associated with this event as no actual Plant condition requiring the Engineered Safety Feature isolations and actuations existed, and all isolations and actuations occurred as designed. Further, the ESF isolations and actuations had no adverse affect on Plant operation and all systems were restored to their pre-event lineup within 20 minutes.

Plant Conditions

- a) Power Level - 85%
- b) Plant Mode - 1 (Power Operation)

Event Description

On August 8, 1987 the plant was at 85% power and on a gradual power ascension when, at 1855 hours, a spurious trip of the Reactor Protection System (RPS) Electrical Protection Assembly (EPA) 3A Breaker caused a loss of power to RPS Bus A. The loss of power on RPS Bus A caused a half-scam in RPS Division A and multiple Engineered Safety Feature (ESF) actuations.

The loss of RPS A power caused a NSSSS Containment Outboard Isolation. The outboard isolations occurred for NSSSS Group 1 (Main Steam Line drains only), Group 2 (Reactor Water Sample Valves), partial Group 4 (Miscellaneous Balance of Plant, two drain valves), Group 5 (Residual Heat Removal (RHR) and Traversing In-Core Probe (TIP) Systems), Group 6 (RHR Shutdown Cooling), and Group 7 (Reactor Water Cleanup). The RWCU System was in operation at the time of the event and was tripped off by the event.

In addition, the loss of RPS A power causes a NSSSS Group 3 (Primary and Secondary Containment Ventilation and Purge System) and partial Group 4 (Miscellaneous Balance of Plant, 6 valves) isolation. The NSSSS Group 3 and partial Group 4 isolation is caused by loss of power to the Reactor Building Exhaust Plenum Process Radiation Monitors, a non-NSSSS ESF trip signal. All required Group 3 and Group 4 actions occurred as designed including the automatic start of the Standby Gas Treatment System and the Control Room Emergency Filtration System and a Reactor Building HVAC Isolation.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
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Washington Nuclear Plant - Unit 2	05000397	87	025	01	03	OF	04

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

Plant Operators responded by switching RPS-Bus A to its alternate power supply and by restoring all systems to their pre-event lineup within 20 minutes.

Plant Engineers and Electricians performed a series of diagnostic tests to determine the cause of the breaker trip. The cause could not be determined. The tests verified the incoming voltage and frequency were within allowable tolerances and that the logic board outputs were correct. The circuit breaker was reclosed with no problems; however, because of recurring problems with these breakers it was decided to replace the breaker with a new model breaker. The failed RPS-EPA Breaker was manufactured by General Electric Company and the part number is TFJ226175WLN. RPS Bus A power was returned to the preferred source RPS-MG-1A through the new RPS-EPA-3A Breaker at 1421 hours on August 9, 1987.

The cause of the spurious EPA breaker trips (and the failure of the breaker to reclose after a trip) is attributed to oxide formation on the coil plunger end of the undervoltage relay coil. This oxide formation reduced the magnetic force which holds the coil of the undervoltage relay in its set (activated) position to the extent that spurious trips occurred and/or the coil would not hold when reset. The root cause is oxide buildup thought to be caused by overheating due to excessive design voltage on the coil. The coil voltage is controlled by a logic card in the EPA Breaker.

#### Immediate Corrective Action

Plant Operators switched RPS Bus A power to its alternate power supply and all Plant systems were restored to their pre-event lineup within 20 minutes.

#### Further Evaluation and Corrective Action

As part of the root cause investigation Plant Electricians installed a line disturbance analyzer to monitor the line input to the RPS-EPA-3A Breaker. Points monitored included power supply current, voltage, and frequency; neutral to ground potential; and radio frequency interference. The line was monitored for twenty days during which no abnormal indications were observed.

The three remaining old model EPA breakers were replaced with new model breakers. There are six EPA breakers in the Plant and, prior to this event, three had been replaced with the new model. To date, the plant has not experienced any spurious actuations with the new breakers.

The Supply System sent two EPA breakers and a logic card to the breaker manufacturer (General Electric) for analysis and root cause determination. The Supply System has received final reports from General Electric. In addition, Plant Engineers discussed EPA breaker problems with other BWR utilities. The Plant Technical Staff is preparing a report on EPA breaker problems.

The EPA Breakers will be periodically replaced (approximately every three years) until the oxide formation problem is resolved.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7 8 7	—	0 2 5	— 0 1	0 4	OF	0 4

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

Safety Significance

There is no safety significance associated with this event because no Plant condition requiring the ESF isolations and actuations existed and all ESF isolations and actuations occurred as designed. The ESF isolations and actuations had no adverse affect on Plant Operations, and all Systems were restored to their pre-event lineup within 20 minutes. The recurring problems caused by spurious trips of the EPA breakers is not adverse to Plant safety because these trips do not prevent the Reactor Protection System from performing its safety function. This event posed no threat to the safety of the public or Plant personnel.

Similar Events

86-008 and 87-019

EIIS InformationText ReferenceEIIS Reference

	System	Component
Reactor Protection System (RPS)	JC	-----
Reactor Protection System		
Electrical Protection Assembly (RPS-EPA-3A)	JC	BKR
RPS-Bus-A	JC	BU
Nuclear Steam Supply Shutoff System (NSSSS)	BD	-----
Standby Gas Treatment (SGT) System	BH	-----
Residual Heat Removal (RHR) System	BD	-----
Reactor Water Cleanup (RWCU) System	CE	-----
Traversing In-Core Probe (TIP) System	IG	-----
Reactor Building Exhaust Plenum Process		
Radiation Monitor	IL	-----
Reactor Building HVAC	VA	-----
Control Room Emergency Filtration System	VH	-----





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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

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Docket No. 50-397

November 20, 1987

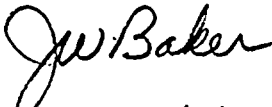
Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Subject: NUCLEAR PLANT NO. 2  
LICENSEE EVENT REPORT NO. 87-025-01

Dear Sir:

Transmitted herewith is Licensee Event Report No. 87-025-01 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Very truly yours,



C.M. Powers (M/D 927M)  
WNP-2 Plant Manager

CMP:ac

Enclosure:  
Licensee Event Report No. 87-025-01

cc: Mr. John B. Martin, NRC - Region V  
Mr. C. J. Bosted, NRC Site (M/D 901A)  
INPO Records Center - Atlanta, GA  
Ms. Dottie Sherman, ANI  
Mr. D. L. Williams, BPA (M/D 399)

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