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SUBJECT: LER 89-021-00:on 890527,ESF isolations & actuations due to RPS EPA breaker trip - cause unknown.
W/8 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

Docket No. 50-397

June 23, 1989

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 89-021

Dear Sir:

Transmitted herewith is Licensee Event Report No. 89-021 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:lg

Enclosure:
Licensee Event Report No. 89-021

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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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7	1 OF 0 4

TITLE (4) Engineered Safety Feature (ESF) Isolations and Actuations Due to a Reactor Protection System (RPS) Electrical Protection Assembly (EPA) Breaker Trip - Cause Unknown

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 5 0 0 0
0 5	2 7	8 9	8 9	— 0 2 1	— 0 0	0 6	2 3	8 9		0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 0 0	20.402(b)	20.405(c)	X 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 366A)
		20.405(a)(1)(iii)	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	TELEPHONE NUMBER
J.D. Arbuckle, Compliance Engineer	AREA CODE 5 0 9 — 3 7 7 - 2 1 1 5

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	J C	B K R	G 0 8 0	Y					

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On May 27, 1989 at 1038 hours an Electrical Protection Assembly (EPA) breaker (RPS-EPA-3D) tripped causing a loss of power to Reactor Protection System (RPS) Bus B. The loss of power on RPS Bus B caused a half-scram in RPS Division B and multiple Engineered Safety Feature (ESF) actuations. At the time of the event the Plant was in a shutdown condition for the annual maintenance and refueling outage.

The loss of RPS B power causes Nuclear Steam Supply Shutoff System (NSSSS) Containment Inboard and Outboard Isolations for Groups 1,2,5,6 and 7; and a Reactor Building Exhaust Plenum Radiation Monitor "Z" signal (a non-NSSSS ESF trip signal) which initiates several ESF actuations including the Standby Gas Treatment (SGT) System, the Control Room Emergency Filtration System, and a Reactor Building Ventilation System isolation. Plant Operators responded by restoring all systems, including Residual Heat Removal (RHR) Shutdown Cooling, to pre-event lineup status by 1100 hours.

The cause of this event is not known. Investigation at the time of the event identified a potential cause (work in progress on Differential Pressure Indicating Switch MS-DPIS-8B), but the cause can not be conclusively determined. Further corrective action consists of installing an upgrade to the EPA breaker equipment. This action will enhance the troubleshooting capabilities for the EPA breakers.

There is no safety significance associated with this event. No actual plant conditions requiring the Engineered Safety Feature isolations and actuations existed, and all isolations and actuations occurred as designed.

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 9	— 0 2 1	— 0 0	0 2 OF 0 4

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

Plant Conditions

a) Power Level - 0%
b) Plant Mode - 5 (Refueling)

Event Description

On May 27, 1989 at 1038 hours an Electrical Protection Assembly (EPA) breaker (RPS-EPA-3D) tripped causing a loss of power to Reactor Protection System (RPS) Bus B. The loss of power on RPS Bus B caused a half-scram in RPS Division B and multiple Engineered Safety Feature (ESF) actuations. At the time of the event the Plant was in a shutdown condition for the annual maintenance and refueling outage.

The loss of RPS Bus B power causes Nuclear Steam Supply Shutoff System (NSSSS) Containment Inboard and Outboard Isolations for Groups 1 (Main Steam Line Drain Valves only), Group 2 (Reactor Water Sample 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 (RWCU) System]. At the time of the event, both the TIP and RWCU Systems were already out of service for maintenance.

In addition, the loss of RPS Bus B power causes an NSSSS Group 3 (Primary and Secondary Containment Ventilation and Purge System) and partial Group 4 [Miscellaneous Balance of Plant (6-Valves)] isolation. These isolations occurred because RPS Bus B is the power supply for Reactor Building Exhaust Plenum Radiation Monitors (Channels B and D). Loss of RPS Bus B power de-energizes these monitors, causing a "Z" signal - a non-NSSSS ESF trip signal. All required Group 3 and 4 actions occurred as designed, including the automatic start of the Standby Gas Treatment (SGT) System and the Control Room Emergency Filtration System, and a Reactor Building HVAC Isolation.

Plant Operators responded by investigating the situation and, finding no immediate cause, shut EPA breaker RPS-EPA-3D and returned RPS Bus B to the normal power supply.

Immediate Corrective Action

As previously stated, Plant Operators responded by investigating the situation and, finding no immediate cause, returned RPS Bus B to the normal power supply. All systems were restored to pre-event lineup status within 22 minutes.

Further Evaluation and Corrective Action

A. Further Evaluation

1. This event is reportable under 10CFR 50.73(a)(2)(iv) as "an event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature (ESF), including the Reactor Protection System (RPS)."

2. There were no structures, components or systems that were inoperable at the start of the event that contributed to the event.

3. The cause of this event is not known. A potential cause was identified following the trip but the cause cannot be conclusively determined. Immediately following the breaker trip, a review of all work in progress was conducted to identify any activities having the potential of causing a trip. Work on Differential Pressure Indicating Switch MS-DPIS-8B (Main Steam Line A High Flow) was in progress at the time of the trip which consisted of splice inspections and lug replacement. [MS-DPIS-8B is a flow switch in the logic circuit for relay RPS-RLY-K3B (Main Steam Isolation Valve Closed) which is utilized in the Nuclear Steam Supply Shutoff System actuation logic]. If during the work on MS-DPIS-8B a short occurred, it would be sensed on RPS Bus B and the EPA breaker might trip on undervoltage before a protective fuse on RPS-RLY-K3B opened. No method is available to confirm the probable cause; however, there have been no spurious trips during the last year of operation and none since this event.

4. Visual inspections of the breaker have also provided no indication of probable cause of the trip.

5. The EPA Breaker (RPS-EPA-3D) is manufactured by General Electric Company (Part No. TFJ226175W6).

B. Further Corrective Action

1. The EPA Breaker Assembly (RPS-EPA-3D) was replaced with a spare component.

2. An upgrade to the EPA breaker equipment has recently been developed that provides enhanced operating characteristics, including modifications to reduce susceptability to spurious trips, a "first-in, seal-in" indicator and improved output voltage control. This upgrade will be procured and installed, subject to availability of the modified components, by the end of the next maintenance and refueling outage.

Safety Significance

There is no safety signficance associated with this event because no Plant condition requiring the ESF isolations and actuations existed, and all ESF actuations occurred as designed.

In addition, at the time of the event reactor water level was greater than 22 feet above the reactor vessel flange with the fuel pool gate removed which provided a large heat sink for core cooling. Plant Operators responded by restoring all systems, including RHR Shutdown Cooling, to pre-event lineup status within 22 minutes.

Accordingly, this event posed no threat to the health and safety of either the public or Plant personnel.

Similar Events

LERs 87-019 and 87-025

EIIS Information

Text Reference	EIIS Reference	
	System	Component
EPA Breaker (RPS-EPA-3D)	JC	BKR
Reactor Protection System (RPS)	JC	---
RPS-Bus-B	JC	BU
Nuclear Steam Supply Shutoff System (NSSSS)	BD	---
Main Steam Line Drain Valves	SN	LOV
Reactor Water Sample Valves	AD	ISV
Residual Heat Removal (RHR) System	BD	---
Traversing In-Core Probe (TIP) System	IG	---
Reactor Water Cleanup (RWCU) System	CE	---
Reactor Bulding Exhaust Plenum Radiation Monitor	IL	MON
Standby Gas Treatment (SGT) System	BH	---
Control Room Emergency Filtration System	VH	---
Reactor Building HVAC	VA	---
MS-DPIS-8B	SB	PDIS
RPS-RLY-K3B	JC	RLY