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SUBJECT: LER 89-018-00: on 890522, ESF isolations & actuation due to
 failure of RPS motor-generated set-components failure.
 W/8 ltr.

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 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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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 16, 1989

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 89-018

Dear Sir:

Transmitted herewith is Licensee Event Report No. 89-018 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. 89-018

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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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 (ESF) Isolations and Actuators Due to Failure of a Reactor Protection System (RPS) Motor-Generator Set-Component 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	5	2	2	8	9	8	9	0	1	8	0	0	0	6	1	6	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)					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)(ix)											
LICENSEE CONTACT FOR THIS LER (12)																								
NAME J.D. Arbuckle, Compliance Engineer										TELEPHONE NUMBER AREA CODE 510 193 1717-1 211115														
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																								
CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC- TURER	REPORTABLE TO NPRDS														
B	JIC	MIG	GIO 80	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)																								
<p>On May 22, 1989 at 0151 hours the Reactor Protection System (RPS) A Motor-Generator Set (RPS-MG-1) failed which 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) actuations. At the time of the event the Plant was in a shutdown condition for the annual maintenance and refueling outage. Reactor water level was greater than 22 feet above the reactor vessel flange which provided a large heat sink for core cooling.</p> <p>The loss of RPS Bus A power causes Nuclear Steam Supply Shutoff System (NSSSS) Containment Outboard Isolations for Groups 1,2,5,6 and 7; and a Reactor Building Exhaust Plenum Radiation Monitor "Z" 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 within 40 minutes.</p> <p>The cause of this event is component failure. The motor bearing close to the flywheel failed, which in turn caused the failure of RPS-MG-1. The motor was replaced with a spare motor and RPS-MG-1 was tested and returned to service.</p> <p>This event posed no threat to the health and safety of either the public or Plant personnel.</p>																								

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Plant Conditions

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

Event Description

On May 22, 1989 at 0151 hours the Reactor Protection System (RPS) A Motor-Generator Set (RPS-MG-1) failed which 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) 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 A power causes Nuclear Steam Supply Shutoff System (NSSSS) Containment 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 A 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 occur because RPS Bus A is the power supply for Reactor Building Exhaust Plenum Radiation Monitors (Channels A and C). Loss of RPS A 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 transferring RPS Bus A to its alternate power supply and restoring all systems to pre-event lineup status within 40 minutes.

Immediate Corrective Action

As previously stated, Plant Operators responded by transferring RPS Bus A to its alternate power supply and restoring all systems to pre-event lineup status within 40 minutes.

Further Evaluation and Corrective ActionA. 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)."

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

2. With the exception of those NSSSS isolations and actuations described in the event description, there were no structures, components or systems that were inoperable at the start of this event that contributed to the event.
3. The cause of this event is mechanical failure. The motor bearing close to the flywheel failed, which in turn caused the failure of the RPS A Motor-Generator Set (RPS-MG-1). The motor was manufactured by General Electric, Model 5K326AN2608P. The cause of the bearing failure is indeterminate.

B. Further Corrective Action

1. The RPS-MG-1 motor was replaced with a motor of different design and the unit was tested and returned to service. The new motor design allows the unit to operate substantially cooler with less of an amperage draw. An evaluation of unit performance is currently being performed as a result of motor failure history.
2. The Plant Technical Department is currently performing an analysis of the frequency of RPS-initiated RHR Shutdown Cooling isolations. Included in this analysis is a review of RPS component failures.

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 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 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 40 minutes.

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

Similar Events

LER 87-020

EIIS Information

Text Reference

Reactor Protection System (RPS)
RPS A Motor Generator Set (RPS-MG-1)
RPS-Bus-A

EIIS Reference

System	Component
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JC	88
JC	BU

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

EIIS InformationText ReferenceEIIS Reference

System Component

Nuclear Steam Supply Shutoff System (NSSSS)
Main Steam Line Drain Valves
Reactor Water Sample Valves
Residual Heat Removal (RHR) System
Traversing In-Core Probe (TIP) System
Reactor Water Cleanup (RWCU) System
Reactor Building Exhaust Plenum Radiation Monitor
Standby Gas Treatment (SGT) System
Control Room Emergency Filtration System
Reactor Building HVAC

BD ---
SN LOV
AD ISV
BD ---
IG ---
CE ---
IL MON
BH ---
VH ---
VA ---