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SUBJECT: LER 89-014-00: on 890509, reactor protection sys actuation
 caused by average power range monitor high power trips.
 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

May 26, 1989

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 89-014

Dear Sir:

Transmitted herewith is Licensee Event Report No. 88-014 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. 89-014

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 1 9 7 1 OF 0 1 4										PAGE (3) 1 OF 0 1 4															
TITLE (4) Reactor Protection System Actuation Caused By Average Power Range Monitor High Power (Not Real) Trips Due To Plant Design																																			
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	9	8	9	0	1	4	0	0	0	5	2	6	8	9	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)																																	
5		20.402(b)										20.405(c)										<input checked="" type="checkbox"/> 50.73(a)(2)(iv)		73.71(b)											
POWER LEVEL (10)		0 1 0 0										20.405(a)(1)(i)										50.36(c)(1)										<input type="checkbox"/> 50.73(a)(2)(v)		73.71(c)	
		20.405(a)(1)(ii)										50.36(c)(2)										<input type="checkbox"/> 50.73(a)(2)(vi)													
		20.405(a)(1)(iii)										50.73(a)(2)(i)										<input type="checkbox"/> 50.73(a)(2)(vii)(A)		OTHER (Specify in Abstract below and in Text NRC Form 365A)											
		20.405(a)(1)(iv)										50.73(a)(2)(ii)										<input type="checkbox"/> 50.73(a)(2)(viii)(B)													
		20.405(a)(1)(v)										50.73(a)(2)(iii)										<input type="checkbox"/> 50.73(a)(2)(ix)													
LICENSEE CONTACT FOR THIS LER (12)																																			
NAME															TELEPHONE NUMBER																				
Steven L. Washington, Compliance Engineer															AREA CODE		510 19 317 171- 12 1018 10																		
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC																									
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)

At 0725 hours on May 9, 1989 a full Reactor Protection System (RPS) actuation occurred. At the time of the event the Plant was shut down for the annual refueling and maintenance outage. The cause of this event is the accidental movement of Local Power Range Monitor (LPRM) cables by Contract Craft personnel while retorquing Control Rod Drive (CRD) mechanisms in the CRD undervessel area. Movement of the high capacitance LPRM cables caused signal noise spikes of sufficient magnitude to cause a high power trip of both Average Power Range Monitor (APRM) Channels "E" and "F" which in turn tripped both RPS Channels "A" and "B". Tripping both RPS channels causes an RPS actuation; however, since the Plant was shut down no actual control rod movement occurred. The "root cause" of this event is Plant Design. One hundred and seventy two LPRM cables drop into the confined CRD undervessel area and it is not feasible to totally prevent accidental movement of the cables while working in the area. Working conditions in the CRD undervessel area are confined and extensive radiological protective clothing is required. A Plant Control Room Operator (CRO) reset the RPS actuation.

Corrective Actions to be taken include: Continued emphasis, of the need to avoid disturbing the LPRM cables. Prior to performing CRD maintenance, instrument cables will be moved out of the way as much as possible and continued inclusion of an article describing this event and similar ones in the Pre-Refueling Outage Monthly Operating Bulletin. There is no safety significance associated with this event since no actual RPS initiating conditions existed and all actuations occurred as designed.

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

At 0725 hours on May 9, 1989 a full Reactor Protection System (RPS) actuation occurred. At the time of the event the Plant was shut down for annual refueling and maintenance. No actual control rod movement occurred.

Prior to the event, at 0720 hours, two Contract Craft personnel entered the Control Rod Drive (CRD) undervessel area to retorque reinstalled CRD mechanisms in support of CRD replacement and refurbishment activities performed during refueling outages. Removal, refurbishment, and reinstallation of a portion of the 185 CRD mechanisms is a routine activity accomplished during each annual refueling outage. The tool used to torque the CRD flange bolts has a 4 foot arm which, in the confined space of the undervessel area, is difficult to operate and totally avoid contact with Local Power Range Monitor (LPRM) cables. In addition to cautioning individuals working in the area to avoid the LPRM cables, plant personnel typically tie up and temporarily suspend the LPRM cables as much out of the way as possible. Despite this, due to the confined area and interference between the cables and bolting, the use of extensive radiological protective clothing and equipment, the size of the tool used and the number of LPRM cables in the area disturbance of the cables occurred.

At 0725 hours the Contract Craft personnel were torquing up drive 02-35 and inadvertently moved LPRM cables to the extent that both Average Power Range Monitor (APRM) Channels "E" and "F" tripped on high power which in turn caused both RPS "A" and "B" channels to trip and initiate the RPS actuation.

Immediate Corrective Action

At 0728 hours, the (licensed) Control Room Operator (CRO) reset the scram. Because of the known sensitivity of the LPRM cables and verification of the on going CRD work it was concluded that the cause of the actuation was inadvertent movement of the cables.

Further Evaluation and Corrective ActionA. Further Evaluation

1. This event is being reported under the provisions of 10CFR50.73(a)(2)(iv) as an event that resulted in an automatic actuation of the Reactor Protection System.
2. There were no systems or components inoperable at the start of this event which contributed to the event.

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

3. The cause of the event was an inadvertent and unplanned APRM E and F high power trip resulting in an RPS actuation. Each APRM Channel is fed by 21 or 22 LPRMS through high capacitance signal cables which drop into the CRD undervessel area. Due to the high capacitance of the LPRM signal cables they are very sensitive to movement. When the Reactor Mode Switch is NOT in "Run" the APRM channel high power trip is setdown to 15% thermal power and a single LPRM signal spike of 330% is enough to trip an APRM channel. Based on previous Plant experience it is known that the movement of LPRM cables can produce a signal spike of sufficient magnitude to cause an APRM channel to trip.
4. The "root cause" of this event is Plant Design. One hundred and seventy two LPRM cables drop into the undervessel area in very confined conditions and it is impossible to not occasionally move a cable or even worse catch a cable in tools or equipment and disturb it. The working conditions in the CRD undervessel area are among the most difficult encountered during a typical refueling outage. Workers must be in radiological protective clothing and bubble suits, and work must be performed while crouching because there is not enough clearance between the CRD work platform and the drive mechanisms to stand.
5. The WNP-2 Technical Specifications require the APRM's to remain operable in operating condition 5. This is not supported by the bases and reference is made to the shorting link removal which indicates that APRM's are needed only in operating condition 5 during a shutdown margin demonstration.

B. Further Corrective Actions

1. The NRC will be contacted to determine the correct reading of the Limiting Condition for Operation and whether an amendment is necessary. Additionally, consideration will be given to submitting an exemption request from the requirement to report these types of actuations during shutdown conditions.
2. Emphasis on the need to avoid disturbing the LPRM cables in the undervessel area will continue to be stressed prior to working in the area.
3. Continued attention to tying the cables out of the way as much as possible will be stressed prior to working in the area.
4. The sensitivity of the Neutron Monitoring System (NMS) [includes LPRM plus Intermediate Range Monitoring System (IRM)] and Source Range Monitoring System (SRM) cables) and the need for extra care and caution during CRD undervessel work will continue to be included annually in the Pre-Refueling Outage Monthly Operating Bulletin.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

Safety Significance

There is no safety significance associated with this event. There were no actual RPS initiating conditions, and the RPS functioned as designed. This event posed no threat to the safety of the public or Plant personnel.

Similar Events

LER 85-033. This is a similar event in that Plant Laborers were spraying water in the CRD undervessel area and caused an Intermediate Range Monitor (IRM) RPS actuation due to cable movement.

LER 88-016. This is a similar event in that a plant surveillance activity which purposely imposed an RPS "A" trip was being conducted when plant personnel in the undervessel area were removing CRD "shoot-out" steel, preparatory to CRD maintenance, and moved an LPRM cable which inturn caused an RPS "B" trip. The combination of these actions caused a full RPS actuation.

The cause identified in both of these LERs is the same (NMS cable movement). The corrective actions identified in LER 85-033 have been effective in preventing recurrence; however, those corrective actions are not applicable to situations involving CRD maintenance as described in this LER and LER 88-016. Total prevention of recurrence of cable movement while servicing the CRD drives in the future cannot be assured due to the difficulties imposed by the plant design, the conditions and tools necessary to perform the work if the APRM's are required to be inservice while in operating condition 5. Removal from service would be an additional corrective action that if permitted would represent the most effective action considered.

EIIS InformationText ReferenceEIIS Reference

	System	Component
Reactor Protection System (RPS)	JC	---
Local Power Range Monitor (LPRM) (cable)	IG	CBL1
Control Rod Drive Mechanism	AA	ROD
Control Rod Drive (CRD) Undervessel Area	AA	---
Average Power Range Monitor (APRM)	IG	---
Control Rod	AA	ROD
CRD Work Platform	AA	CRN
Reactor Pressure Vessel (RPV)	--	---
Control Rod Drive Housing Support Structure	AA	SPT
CRD Scram Valves	AA	V
Neutron Monitoring System (NMS)	JC	CBL1
Intermediate Range Monitoring System (IRM)	JC	CBL1
Source Range Monitoring System SRM	JC	CBL1
Support ("shoot-out") Steel	AA	SPT

