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SUBJECT: LER 90-002-00:on 900118,ADS inoperable due to unqualified power connector installed on solenoid pilot valve.
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

February 13, 1990

Docket No. 50-397

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

Subject: NUCLEAR PLANT NO. 2
LICENSEE EVENT REPORT NO. 90-002

Dear Sir:

Transmitted herewith is Licensee Event Report No. 90-002 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,

J W Baker

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

CLF:lr

Enclosure:
Licensee Event Report No. 90-002

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

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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 5

TITLE (4) AUTOMATIC DEPRESSURIZATION SYSTEM (ADS) INOPERABLE DUE TO AN UNQUALIFIED POWER CONNECTOR INSTALLED ON SOLENOID PILOT VALVE CAUSED BY INEFFECTIVE COMMUNICATION

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 1	1 8	9 0	9 0	— 0 0 2	— 0 0	0 2	1 3	9 0		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	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)	X 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
	AREA CODE
C. L. Fies, Compliance Engineer	5 0 9 3 7 7 - 2 5 0 1 E X T 2 0 3 9

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

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 January 18, 1990 a reportability evaluation was approved which directed that an event that was discovered on June 2, 1989 be reported per 10CFR50.73. The evaluation, which was ongoing from July through December 1989, concluded that one of the main steam solenoid pilot valves (MS-SPV-5CA) was inoperable from June 1986 to June 1989. This condition was caused by the installation of an unqualified power connector on MS-SPV-5CA and failure to implement corrective action that should have discovered this condition in February 1987. This solenoid pilot valve provides Division I (A) initiation to relief valve (MS-RV-5C) which is one of seven valves that make up the Automatic Depressurization System (ADS).

The root cause of this event was personnel related involving inadequate communication between the plant maintenance and technical organizations.

Immediate corrective action was taken in June 1989 to replace the faulty connector.

The event posed no threat to the health and safety of either the public or plant personnel since the ADS system would have been able to perform its safety function without the Division I solenoid pilot valve. The ADS valves have two solenoid pilot valves and the one from Division II was operable during this time period.

Plant Conditions

Power Level - 0%
Plant Mode - 5

Event Description

On January 18, 1990 a reportability evaluation was approved which directed that a condition discovered on June 2, 1989 be reported per 10CFR50.73. The Engineering evaluation, which was ongoing from July through December 1989, concluded that one of the solenoid pilot valves (MS-SPV-5CA) was inoperable from June 1986 to June 1989. This condition was caused by the installation of an unqualified power connector on MS-SPV-5CA and failure to implement corrective action that should have discovered this condition in February 1987. This solenoid pilot valve provides Division I (A) initiation to relief valve (MS-RV-5C) which is one of seven valves that make up the Automatic Depressurization System.

The ADS is a backup Emergency Core Cooling System (ECCS) designed to quickly reduce reactor pressure in the unlikely event of failure of the High Pressure Core Spray (HPCS) system. The ADS is composed of seven specially designated Relief Valves (RV) that provide rapid depressurization of the primary system. Each RV is actuated by either of two solenoid pilot valves (one from Division I (A) and one from Division II (B)). The reportability evaluation period was extended to allow time for evaluation of environmental qualifications of the connector since at one time it appeared that the connector could be qualified because of the materials used in its construction.

This event was discovered during the Spring 1989 refueling outage when several work activities on the relief valves (RV) resulted in the need to replace connectors on the associated solenoid pilot valves. During this activity the Plant System Engineer discovered the unqualified connector installed on MS-SPV-5CA.

Immediate Corrective Action

Immediate corrective action was taken to replace the unqualified connector on June 11, 1989.

Further Evaluation and Corrective Action

A. Further Evaluation

1. This event is being reported as a "....deviation from the Plant's Technical Specifications...." per the requirements of 10CFR50.73(a)(2)(i)(B). Specifically, MS-SPV-5CA was inoperable between June 11, 1986 and June 11, 1989 by the Technical Specification definition and the action statement for restoration to operable status was exceeded.

2. During this time period the valve was tested and successfully passed all surveillance test requirements run under normal containment environmental conditions. This included tests performed per the requirements of PPM 7.4.4.2.1.2, Safety Relief Valve Channel Calibration and Operability, which tested the operation of MS-SPV-5CA during the Spring refueling outages in 1987, 1988, and 1989.

3. The review showed this event started on June 11, 1986 when the Division I power connector to MS-SPV-5CA was found damaged. Plant maintenance personnel took immediate action to replace the connector using a "Vital" maintenance work request. At that time the only connector qualified for this application was a Model CVA6R10SL-4S ITT Cannon connector. Rather than use this qualified connector for replacement the damaged unit was replaced with a model CA3106HR10SL-4S ITT Cannon connector that was not qualified. This connector is made with stainless steel and ceramic but does not have a moisture seal. In a moisture environment the ceramic material could absorb moisture and cause a short circuit.

4. Further evaluation showed a connection between this event and the one reported in LER 86-037 dated December 19, 1986. LER 86-037 reported a plant shutdown which occurred when an unqualified connector was discovered installed on acoustic monitor channel 5C. A review of maintenance documentation in June 1989 showed that the connector installed on acoustic monitor channel 5C was identical to the one installed as a power connector to MS-SPV-5CA.

5. One of the corrective actions identified in LER 86-037 was to review all plant "Vital" Maintenance Work Requests since their inception to ensure that: "All equipment qualification requirements were met and any substituted parts are in compliance with Plant requirements". Plant maintenance personnel produced a listing of "Vital" maintenance work requests (MWRs), including the one that installed the unqualified power connector on MS-SPV-5CA. This list was given to the Plant Technical Spare Parts Program Organization during January 1987. A Spare Parts Engineer reviewed these "Vital" MWRs in February 1987 but failed to identify the unqualified connector.

6. To assure that current material control procedures would preclude a recurrence of this type of event a Material Request was submitted requesting the same type Cannon connector for application on MS-SPV5CA. The request was denied by the Materials Management System (MMS) since this connector is not on the Bill of Material for the Solenoid Pilot Valve.

7. The root cause of this event was personnel related involving inadequate communication between the Plant Maintenance and Technical organizations. The description of work performed on the "Vital" MWR that installed the connector was not clear. The MWR discusses a "BNC" connector that is associated with the acoustic monitors and does not apply to the installation of the Cannon connector on the solenoid pilot valve.

8. There were no structures, components or systems that were inoperable prior to the start of this event which contributed to the event.

B. Further Corrective Action

1. A re-review will be performed of all the "Vital" MWRs associated with this event to assure all Equipment Qualification requirements were met and all replaced parts are in compliance with Plant requirements.

2. Several corrective actions were taken in response to LER 86-037 that corrected deficiencies in the Maintenance Work Request (MWR) system and the manner in which the MWR system interfaced with Environmental Requirements. These corrective actions (discussed in LER 86-037) were all implemented in the 1987 time frame. In addition, corrective actions have been taken to improve the work instructions and the description of work performed on MWRs during this three year time period.

3. The Maintenance Department is taking steps to improve communication on MWRs as part of their "Maintenance Improvement Program." This includes additional detail for work instructions and additional information on the description of work performed.

Safety Significance

This event has no safety significance since there are several redundant features to deal with Loss of Coolant Accidents as described in Section 6.3 of the FSAR. The first defense against the LOCA when the primary system remains at high pressure (small breaks) is the High Pressure Core Spray (HPCS). Only in the event of failure of the HPCS does the Automatic Depressurization System (ADS) require actuation. The ADS is an emergency system designed to relieve steam pressure in the main steam lines and reactor vessel to allow the Low Pressure Emergency Core Cooling Systems (ECCS) to inject. The ADS has several redundant features. It is composed of seven Safety Relief Valves (SRVs) designated as ADS valves. The ADS valve in question (MS-V-5C) has three solenoid pilot valves (MS-SPV-5CA, MS-SPV-5CB and MS-SPV-5CC). These solenoid pilot valves are connected in parallel such that any one being energized will admit nitrogen to the piston to open the relief valve. The pilot

valves are energized by either: 1) the ADS logic (A and B pilot valves), or 2) manual control switches (A, B, or C pilot valves). In the event of an accident condition and the failure of the A pilot valve due to moisture entrainment in the connector, the valve (MS-RV-5C) would still have been automatically actuated by the B pilot valve. In addition, manual actuation of the valve via the C pilot valve would have been possible using the switches in the control room. This valve is not one of the four main steam relief valves required to operate for six months following a Loss of Coolant Accident. It is only required to operate for 24 hours in a post-accident environment.

Similar Events

LER 86-037 discussed a similar event involving an unqualified connector (see above).

EIIS Information

Text Reference	EIIS Reference System	EIIS Reference Component
Automatic Depressurization System (ADS)	BG	---
Main Steam Solenoid Pilot Valve 5CA (MS-SPV-5CA)	SB	PSV
Main Steam Relief Valve 5C (MS-RV-5C)	SB	RV
Main Steam Solenoid Pilot Valve 5CB (MS-SPV-5CB)	SB	PSV
Main Steam Solenoid Pilot Valve 5CC (MS-SPV-5CC)	SB	PSV
High Pressure Core Spray System	BG	---