

# ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

## REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9105310156 DOC. DATE: 91/05/22 NOTARIZED: NO DOCKET #  
 FACIL: 50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397  
 AUTH. NAME AUTHOR AFFILIATION  
 REIS, M.P. Washington Public Power Supply System  
 BAKER, J.W. Washington Public Power Supply System  
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-010-00: on 910422, potentially inability to isolate primary containment occurred due to wiring separation error. Caused by inadequate work instructions. SGT drawings revised & MSLC separation problems corrected. W/910522 ltr.

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

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INTERNAL:	ACNW		2	2		ACRS		2	2
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	NRR/DET/EMEB 7E		1	1		NRR/DLPQ/LHFB11		1	1
	NRR/DLPQ/LPEB10		1	1		NRR/DOEA/OEAB		1	1
	NRR/DREP/PRPB11		2	2		NRR/DST/SELB 8D		1	1
	NRR/DST/SICB8H3		1	1		NRR/DST/SPLB8D1		1	1
	NRR/DST/SRXB 8E		1	1		REG FILE 02		1	1
	RES/DSIR/EIB		1	1		RGN5 FILE 01		1	1
EXTERNAL:	EG&G BRYCE, J.H		3	3		L ST LOBBY WARD		1	1
	NRC PDR		1	1		NSIC MURPHY, G.A		1	1
	NSIC POORE, W.		1	1		NUDOCS FULL TXT		1	1

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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 22, 1991  
G02-91-106

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

Subject: NUCLEAR PLANT NO. 2  
LICENSEE EVENT REPORT NO. 91-010

Dear Sir:

Transmitted herewith is Licensee Event Report No. 91-010 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 for*

J. W. Baker (M/D 927M)  
WNP-2 Plant Manager

JWB:ac

Enclosure:  
Licensee Event Report No. 91-010

cc: Mr. John B. Martin, NRC - Region V  
Mr. C. Sorensen, NRC Resident Inspector (M/D 901A)  
INPO Records Center - Atlanta, GA  
Ms. Dottie Sherman, ANI  
Mr. D. L. Williams, BPA (M/D 399)  
NRC Resident Inspector - walk over copy

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## LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1) Washington Nuclear Plant - Unit 2										DOCKET NUMBER (2) 0 1 5 0 0 0 3 9 7 1										PAGE (3) 1 OF 0 5																																
TITLE (4) POTENTIALLY INABILITY TO ISOLATE PRIMARY CONTAINMENT DUE TO WIRING SEPARATION ERROR CAUSED BY INADEQUATE WORK INSTRUCTIONS																																																				
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)												
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OPERATING MODE (9)									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)									<input checked="" type="checkbox"/> 50.73(a)(2)(iv)									73.71(b)																
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									20.405(a)(1)(iii)									50.73(a)(2)(i)									<input type="checkbox"/> 50.73(a)(2)(viii)(A)																									
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LICENSEE CONTACT FOR THIS LER (12)																																																				
NAME M. P. Reis, Compliance Engineer															TELEPHONE NUMBER AREA CODE 5 0 9 3 7 7 - 2 3 8 5																																					
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																				
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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 March 8, 1991, during the performance of Single Failure Analysis studies, Design Engineering personnel discovered a wiring separation error affecting the containment isolation valves for the Reactor Recirculation (RRC) flow control valve hydraulic supply. On April 22, 1991, after evaluation of the nature and extent of the identified problems, it was concluded that a "smart short" could prevent primary containment isolation of up to four, 1" diameter lines. This is a condition which alone could have prevented the safety function of the RRC hydraulic isolation valves.

Accessible areas through which the affected circuits run were immediately included on an hourly fire tour.

This condition was caused by inadequate work instructions issued by the Architect Engineer during initial plant construction.

RRC wiring errors will be corrected during the ongoing R6 refueling outage.

No safety significance is attributed to this condition. Routine surveillance has shown these valves to be highly reliable and the probability of the valves actually affecting the containment function is extremely low. Accordingly, this event did not affect the health and safety of either the public or plant personnel.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		9 1	0 1 0	0 0	0 2	OF	0 15

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

Plant Conditions

Plant Mode - 5 - Refueling  
Plant Level - 5%

Event Description

On March 8, 1991, during the performance of Single Failure Analysis studies, Design Engineering personnel discovered a wiring separation error affecting the containment isolation valves for the Reactor Recirculation Cooling (RRC) flow control valve hydraulic supply. On April 22, 1991, after evaluation by Technical and Engineering personnel of the nature and extent of the identified problems, it was concluded that a "smart short" could prevent isolation of up to four 1" diameter hydraulic lines.

While performing a single failure analysis for the Standby Gas Treatment (SGT) system, Supply System engineers found what appeared to be a violation of "Separation within Division" design specifications. It was later determined that actual SGT field configuration was correct and that confusing notes on the SGT drawings led the engineers to believe there was a problem. Based on the SGT discrepancies, engineering investigated the other two systems which have similar intra-divisional separation criteria. That investigation revealed that proper separation was not maintained for certain components in the Main Steam Leakage Control (MSLC) system, in addition to the RRC hydraulic valves.

Engineering analysis concluded that the MSLC wiring concerns would not result in loss of system or containment isolation function.

Immediate Corrective Action

Upon initial reporting of the problem, an hourly fire tour was initiated for accessible areas in which the wires were not properly separated.

Further Evaluation and Corrective ActionA. Further Evaluation

1. This condition is reported under the requirements of 10CFR50.73(a)(2)(v), a condition that alone could have prevented the fulfillment of the safety function of a structure needed to control the release of radioactive material. In addition, the condition was determined to be reportable under 10CFR50.72(b)(1)(iii)(C). The NRC Operations Center was notified at 0907 hours on April 22, 1991.
2. No other systems, structures or components were inoperable which contributed to this condition.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 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.

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

3. The root cause for this condition is Procedures Less Than Adequate/Work Instructions Inadequate. The RRC wiring separation problem has existed since initial plant construction. Engineering direction issued by the Architect Engineer to correct initial intra-divisional separation errors were not consistently carried over into the work instructions. Deficiencies noted on work instructions for intra-divisional separation include: drawing notes required separation for one end of a cable but not the other; field routing instructions (conduit routing instruction, cable pull slips) were not specific as to separation requirements; installation of fire-proofing material (Siltemp) was not specified in some instructions and in others was a drawing note rather than a specific installation instruction.
4. Certain plant systems have special requirements for wiring separation within a division (intra-divisional separation). System operational reliability requires redundant components within a train or subsystem to be energized from the same power source rather than from independent power sources. However, to protect against a single failure compromising redundant components, the wiring to intra-divisionally separated components cannot be routed together.

One system requiring intra-divisional separation is the hydraulic control system (HY) for the two RRC Flow Control Valves [RRC-FCV-60A(B)]. The hydraulic source is located outside of Primary Containment. Each FCV has four hydraulic lines associated with it, for a total of eight hydraulic lines which penetrate Primary Containment. Each hydraulic line has two isolation valves, both of which are located outside of the Primary Containment. To ensure that loss of a single power source would not affect both FCVs, the isolation valves associated with RRC-FCV-60A are all powered from critical Division I and those associated with RRC-FCV-60B from Division II. As a result, the wiring for the redundant isolation valves cannot be run in the same conduit or cable sections.

During Single Failure Analysis studies, Design Engineering personnel discovered control wiring separation errors which affect the hydraulic line isolation valves. A single failure (e.g. a "smart short") could potentially preclude isolation of the hydraulic lines for one FCV. Since the isolation valves associated with RRC-FCV-60A and RRC-FCV-60B are powered from different divisions, a single failure would not compromise both sets of isolation valves.

Further investigation focused on the hydraulic piping inside containment. This investigation revealed that, while the pipes would withstand seismic loading, there was no assurance that the piping would survive other postulated accident loadings (jet impingement, pipe whip, etc). Consequently it was determined that a single failure could prevent the containment isolation function and potentially allow release of radionuclides to the reactor building during accident conditions.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 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.

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

5. Only two other plant systems have similar intra-divisional separation requirements, Standby Gas Treatment (SGT) and Main Steam Leakage Control (MSLC). Review of these systems found no field problems with SGT, although some drawing errors were noted.

For MSLC, engineering evaluation of the separation errors concluded that all necessary safety functions associated with MSLC (system function and containment isolation) were preserved, even assuming a single failure. Nevertheless, an hourly fire tour was initiated for the affected MSLC wire routing areas which are accessible during operations. The fire tour will be maintained until separation issues are resolved.

6. Review of plant surveillance records shows that the valves have been tested, on the average, every 4.47 months, with no indications of control wiring failures.
7. In this instance, the "smart short" could contribute to a containment bypass event (i.e. failure to isolate coincident with a line break.) Using actual surveillance data for the HY valves and Probabilistic Risk Assessment methodology, it can be demonstrated that the probability of a bypass event was less than  $10E-8$ . This is below the threshold at which Generic Letter 88-20, Individual Plant Evaluation for Severe Accident Vulnerabilities-10CFR50.54 requires such events to be analyzed.
8. Current Supply System Engineering design instructions require review of installation instructions. If existing procedures and instructions are not sufficient for a particular application, additional instructions are provided. These instructions must note if any further instructions are contained on drawings. Further, Engineering and Design staff personnel receive periodic training on separation criteria. Finally, the Maintenance Work Instruction procedure requires divisional separation to be maintained.

A review of problem reports since January, 1989 reveals no indication of inter- or intra-divisional separation problems caused by Supply System design or installation practices.

B. Further Corrective Action

1. Wiring separation errors associated with the hydraulic isolation valves will be corrected during the ongoing refueling outage (R6).
2. The MSLC separation problems will be corrected. This will enhance equipment and personnel protection by ensuring double isolation of low pressure piping from main steam piping.
3. SGT drawings will be revised to eliminate confusing notes.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 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.

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YEAR SEQUENTIAL REVISION  
NUMBER NUMBER NUMBER

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

Safety Significance

This event is of no safety significance. There was no actual demand for containment isolation and the valves were found to be fully functional when tested during the R6 refueling outage. PRA methodology indicates that the probability of a containment bypass event is less than  $10E-8$ .

Similar Events

Several LERs associated with wiring separation errors have been written (85-023 series, 89-032 and 89-039). These addressed a variety of issues related to inadequate separation between redundant class IE divisions, inadequate fusing (single fuse rather than double), and routing of failsafe cables in non-failsafe raceways. However, none of these involved intra-divisional separation concerns. Since the deficiencies presented in this LER predate the corrective actions in the similar LERs, the improved sensitivity to separation criteria gained from similar LERs would not have prevented the existing problems.

EIIS InformationEIIS ReferenceText ReferenceSystem CodeComponent Code

RRC

AD

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HY

AD

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SGT

BH

--

MSLC

SB

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RRC-FVC-60A(B)

AD

FCV

HY-V-XX (16 valves total)

AD

V