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 FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
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 RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-010-01:on 910422,inability to isolate primary
 containment due to wiring separation error caused by
 inadequate work instructions.Initiated hourly fire tour for
 accessible areas.W/930702 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 6
 TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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A04

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

July 2, 1993
G02-93-172

Docket No. 50-397

Subject: NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21
LICENSEE EVENT REPORT NO. 91-010-01

Licensee Event Report (LER) 91-010 documented an instance whereby intra-divisional electrical separation criteria were not maintained for certain components within the Main Steam Leakage Control (MSLC) System. As stated within the LER, these separation discrepancies were evaluated with respect to single failure criteria and determined to not adversely affect the availability of necessary safety functions associated with the MSLC System. It was also stated that these MSLC separation discrepancies would be corrected.

An engineering evaluation of MSLC has been completed that indicated the system could be left in its original configuration. No modifications for electrical separation are required. The enclosed revision to LER 91-010 includes this updated information.

Sincerely,



J. V. Parrish (Mail Drop 1023)
Assistant Managing Director, Operations

JVP/CLF/cgeh
Enclosure

cc: Mr. B. H. Faulkenberry, NRC - Region V
Mr. R. Barr, NRC Resident Inspector (Mail Drop 901A, 2 Copies)
INPO Records Center - Atlanta, GA
Mr. D. L. Williams, BPA (Mail Drop 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 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	NUMBERS(S)
0	4	2	2	9	1	9	1	0	1	0	0
0	7	0	2	9	3					0	5
										0	5

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)	77.71(b)
				20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.73(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
C. L. Fies, Licensing Engineer	
	AREA CODE
	5 0 9 3 7 7 - 4 1 4 7

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) ☒ NO

ABSTRACT (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.

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TITLE (4) POTENTIALLY INABILITY TO ISOLATE PRIMARY CONTAINMENT DUE TO WIRING SEPARATION ERROR CAUSED BY INADEQUATE WORK INSTRUCTIONS													

Plant Conditions

Power Level - 5%
Plant Mode - 5 - Refueling

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 Action

A. 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.

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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.

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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 were corrected during the R6 refueling outage.
2. An engineering evaluation of MSLC has been completed that indicated the system could be left in its original configuration. No modifications for electrical separation are required.

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3. SGT drawings will be revised to eliminate confusing notes. This will be completed by December 31, 1993.

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 Information

Text Reference

RRC
HY
SGT
MSLC
RRC-FVC-60A(B)
HY-V-XX (16 Valves Total)

EIIS Reference

<u>System</u>	<u>Component</u>
AD	---
AD	---
BH	---
SB	---
AD	FCV
AD	V