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 AUTH. NAME AUTHOR AFFILIATION
 FIES, C.L. Washington Public Power Supply System
 BAKER, J.W. Washington Public Power Supply System
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-031-00: on 920701, potential for exceeding continuous rating of Divs I & II DG 1 & 2 identified due to inadequate circuit electrical separation. Caused by design deficiency. Items placed on hourly fire tour. W/920731 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

July 31, 1992
602-92-184

Docket No. 50-397

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

**SUBJECT: NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21
LICENSEE EVENT REPORT NO. 92-031**

Transmitted herewith is Licensee Event Report No. 92-031 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.

Sincerely,

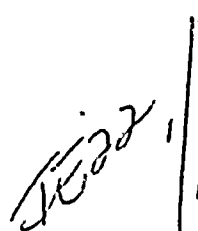


J. W. Baker
WNP-2 Plant Manager (Mail Drop 927M)

JWB/CLF/cgeh
Enclosure

cc: Mr. J. B. Martin, NRC - Region V
Mr. C. Sorensen, 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)

POTENTIAL FOR DIESEL GENERATOR OVERLOAD DUE TO ELECTRICAL SEPARATION PROBLEMS

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	7	0	1	9	2	9	2	0	3	1	0	0	0	7	3	1	9	2							0	5	0	0	0			

OPERATING MODE (9) 4 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)	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, Compliance 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 July 1, 1992, a Safety Evaluation was completed that identified a potential for exceeding the continuous rating of the Division I and II diesel generators (DG-1 and DG-1) during accident conditions because of inadequate associated circuit electrical separation involving the trip circuits for nonsafety related loads.

The root cause of this event was equipment design deficiency caused by the Architect-Engineer who failed to thoroughly implement Electrical Separation requirements.

Immediate corrective action was taken to place these items on an hourly fire tour. A Plant Modification will be implemented to correct the deficiencies before the end of the next refueling outage.

The event posed no threat to the health and safety of either the public or plant personnel.

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TITLE (4) POTENTIAL FOR DIESEL GENERATOR OVERLOAD DUE TO ELECTRICAL SEPARATION PROBLEMS							

Plant Conditions

Power Level - 0%

Plant Mode - 4

Event Description

On July 1, 1992, a Safety Evaluation was completed that identified a potential for exceeding the continuous rating of the Division I and II diesel generators during accident conditions because of inadequate electrical separation involving the trip circuits for nonsafety related loads. This problem was discovered during a safety classification review of instrumentation associated with the Reactor Closed Cooling (RCC) System. The electrical separation issues involve incorrect divisional assignments of cables and lack of separation between redundant divisions. Non-Class 1E circuits are connected to Class 1E circuits without adequate electrical isolation.

The accident trip circuits involved are in safety related low voltage switchgear used to trip Non-IE components in the event of an accident. The components are nonsafety related loads (up to 200 horsepower) that are normally powered from the safety related diesel backed 480 volt AC critical switchgear. These loads include the three Reactor Closed Cooling Pumps (RCC-P-1A, 1B, and 1C), the Reactor Building Outside Air Fans (ROA-FN-1A and 1B) and the Reactor Building Exhaust Air Fans (REA-FN-1A and 1B). By design these loads are to be tripped from the safety related buses during accident conditions (high drywell pressure or low reactor vessel water level). The purpose of the trip is to ensure that nonsafety related loads do not challenge the safety related loads per the requirements of the WNP-2 electrical separation criteria. To meet its design requirement Diesel Generator One (DG-1) must have RCC-P-1A, ROA-FN-1A, and REA-FN-1A tripped during accident conditions. For Diesel Generator Two (DG-2) RCC-P-1B, RCC-P-1C, ROA-FN-1B and REA-FN-1B must be in a tripped condition.

Immediate Corrective Action

Immediate corrective action was taken to place these items on an hourly fire tour to minimize the probability of fire that could cause a breaker control circuit fault.

Further Evaluation and Corrective Action

A. Further Evaluation

1. This event is being reported per the requirements of 10CFR50.73(a)(2)(v) as "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to: (A) Shut down the reactor and maintain it in a safe shutdown condition...."

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2. This event was called in to the NRC Operations center as a 4 hour nonemergency report on July 10, 1992. This call was delayed because the impact on the operability of both diesel generators was not clearly communicated between the responsible parties.
3. The origin of the problem with the RCC circuits was traced to a design change (PED-218-E-B024) approved in March 1983. This design change downgraded the cable designations from safety related to nonsafety related. However, the cabling was still installed to Class 1E requirements. Follow-on work maintained adequate separation for the power circuitry but the separation criteria were not maintained on the breaker control circuits.
4. The root cause of this event was inadequate design analysis by the Architect-Engineer (AE) in response to Electrical Separation requirements.
5. There were no structures, components or systems that were inoperable prior to the start of this event which contributed to the event.

B. Corrective Actions

1. This problem is specific to electrical circuit breakers used as isolation devices for Non-Class 1E loads powered from Class 1E sources. All Division 1 and 2 4160 and 480 Volt AC circuit breaker circuits feeding Non-Class 1E equipment having accident trip circuits have been reviewed and those identified in this LER are the only ones found to have this deficiency.
2. The plant modification will be implemented to correct the separation problems no later than the next refueling outage on or about June 1, 1993.

Safety Significance

This event has no safety significance. The probability of a fire being initiated from failures in these low energy circuits and preventing load shedding of the safety related buses is very low. In addition, the scenario requires the postulation of a simultaneous accident (LOCA, HELB, etc., concurrent with a loss of off-site power) since the diesels only become overloaded when the ECCS pumps are started in conjunction with the nonsafety related loads failing to trip.

The safety significance is also mitigated by current plant procedures. Abnormal condition procedures, PPM 4.12.4.6, FAZ Recovery, requires plant operators to immediately verify the RCC pumps, and ROA and REA fans have tripped in response to an accident signal. If any of these loads are not tripped manual action would be taken locally at the breaker to assure these devices do not remain on the safety related buses.

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To assure the plant operators have time to take manual action prior to DG failure, the diesel generator calculations for diesel loading (E/I-02-91-03, Revision 1) were reviewed. These calculations show the vendor provided 200 hour/year rating of DG-1 and DG-2 as 4900 KW. The loading on DG-2 with the additional four nonsafety related loads is below this rating. For DG-1 the three additional loads would increase the total load to a value slightly above this rating but still below the 30 minute/year brake horsepower rating of 5600 KW.

No fires were experienced in the areas associated with the identified cables. The fire detection systems remained operable and fire tours were and are being performed on a routine basis. The control circuitry involved has IEEE 383 qualified wiring and is low energy 125 Volt DC fused at 10 amps. Thus, the probability of a fire being initiated from these low energy circuits and preventing load shedding of the safety related buses is believed to be very low. The health and safety of the public and plant personnel was not affected by this event.

Similar Events

LER 89-032, "Violation of Electrical Separation Criteria Found During Technical Evaluation Caused by Design Deficiency." This LER described a situation where a Digital Electro-Hydraulic (DEH) Turbine Control System circuit was found to have only one circuit protective device (fuse) installed between the Class 1E power panel and the Non-Class 1E load (DEH).

LER 89-039, "Inadequate Electrical Separation and Nonfailsafe Design of the Reactor Building Exhaust Air Radiation Monitoring System." This LER described three discrepancies pertaining to inadequate electrical separation in Control Room Cabinets, routing of failsafe cable in nonfailsafe raceways outside of the Power Generation Control Complex (PGCC), and a nonfailsafe design response of the radiation monitors to inoperative downscale conditions.

LER 90-026, "Inadequate Electrical Power Supply Separation in two Control Room Panels Due to Design Error." This LER described a situation where it was discovered that safety-related and nonsafety-related 24 volt DC power supplies were tied together at two locations in the control room.

LER 92-021, "Inadequate Electrical Separation Pertaining to Post-Accident Radiation Monitoring Instrument Circuitry and Quality Class 1 Components Connected to Quality Class 2 Power Due to Less Than Adequate Design." This LER described separation problems with various safety related instrumentation.

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The separation problems described in the above LERs and the one described in this LER appear to be random items of noncompliance with the separation criteria and not amenable to general corrective action. They describe separation problems in low energy associated circuits that have a very low probability of causing a fire. These separation problems have been found during plant modification package preparation and , more recently, from on-going programs such as the Electrical Wiring Diagram Upgrade Program and the Component Safety Classification Program.

EIIS Information

Text Reference

Reactor Closed Cooling (RCC)
 Diesel Generators (DG-1 and DG-2)
 Reactor Cloud Cooling Pumps
 (RCC-P-1A, 1B, and 1C)
 Reactor Building Outside Air Fans
 (ROA-FN-1A and 1B)
 Reactor Building Exhaust Air Fans
 (REA-FN-1A and 1B)

EIIS Reference

System Component

CC	--
EK	GEN
CC	P
VA	FN
VA	FN