ACCELERATED DISTRIBUTION DEMONSTRATION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9203250357 DOC.DATE: 92/03/18 NOTARIZED: NO DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
FULLER,R.E. Washington Public Power Supply System
BAKER,J.W. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 92-005-00:on 920219,thermal overloads prevented motors from performing their safety functions.Caused by misapplication of design inputs.Motors in Table 1 were replaced.W/920318 ltr.

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

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD5 LA	1	1	PD5 PD	1	1
	ENG,P.L.	1	1			
INTERNAL:	ACNW	2	2	ACRS	2	2
	AEOD/DOA	1	1	AEOD/DSP/TPAB	1	1
	AEOD/ROAB/DSP	2	2	NRR/DET/EMEB 7E	1	1
	NRR/DLPQ/LHFB10	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

RIDS/ADDS

RIDS/ADDS

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 20079) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

A04

FULL TEXT CONVERSION REQUIRED
TOTAL NUMBER OF COPIES REQUIRED: LTTR 32 ENCL 32

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

March 18, 1992
G02-92-067

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. 92-005

Transmitted herewith is Licensee Event Report No. 92-005 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)

Enclosure

cc: Mr. John B. Martin, NRC - Region V
Mr. C. Sorensen, NRC Resident Inspector (Mail Drop 901A, 2 Copies)
INPO Records Center - Atlanta, GA
Ms. Dottie Sherman, ANI
Mr. D. L. Williams, BPA (Mail Drop 399)

IE22

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 5

TITLE (4)

INADEQUATELY SIZED THERMAL OVERLOADS FOR CLASS 1E MOTORS

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 2	1 9	9 2	9 2	-- 0 0 5	-- 0 0	0 3	1 8	9 2		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	1 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
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	below and in Text, NRC.
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	Form 366A)
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
R. E. Fuller, Compliance Engineer	AREA CODE 5 0 9 3 7 7 - 4 1 4 8

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 (16)

On February 19, 1992, a reportability evaluation was completed on the subject of undersized motor thermal overload heaters. The reportability evaluation concluded the condition identified by an Electrical Design Engineer on June 5, 1991, was reportable. The condition was determined to have the potential to prevent multiple systems from performing their safety function under extended low voltage conditions. This condition was discovered by the Engineer during a Supply System initiated review of motor overloads for 460 VAC and 125 and 250 VDC motors. The Plant was shutdown for the refueling outage when the condition was identified.

The thermal overloads (TOL) that had the potential for preventing motors from performing their safety function were replaced per a new TOL selection criteria.

The root cause of this condition was misapplication of design inputs. The TOL selection criteria used to make the original TOL selection were based on industry standards for continuous duty motors and did not take into account motor operation at low voltage conditions.

Any remaining TOLs for Class 1E motors that have not been replaced per the new selection criteria that are determined to require a 20 percent trip margin at low voltage conditions will be replaced.

Although multiple systems were affected, the safety significance of this condition associated with the ability of the Plant to reach a safe shutdown condition is considered negligible. The probability of several accident conditions occurring simultaneously to prevent one or more of the affected systems from performing its safety function was considered low.

Plant Conditions

Power Level - 100%
Plant Mode - 1

Event Description

On February 19, 1992, a reportability evaluation was completed on the subject of undersized motor thermal overload heaters. The reportability evaluation concluded the condition identified by an Electrical Design Engineer on June 5, 1991, was reportable. The condition was determined to have the potential to prevent multiple systems from performing their safety function under extended low voltage conditions. This condition was discovered by the Engineer during a Supply System initiated review of motor overloads for 460 VAC and 125 and 250 VDC motors. The Plant was shutdown for the refueling outage when the condition was identified.

During review of the WNP-2 fuse and motor overload selection criteria, as previously committed to in LER 89-044, it was determined that the criteria did not ensure operation of Class 1E motors at low voltage conditions just above the undervoltage transfer relay setpoint. New selection criteria were developed with consideration of low voltage conditions.

The new criteria require a margin of 20 percent between the motor running current and overload tripping currents for Class 1E continuous duty motors with Service Factors (SF) of 1.0 and 1.15. The 20 percent margin allows for thermal overload (TOL) heater inaccuracy and motor terminal voltage variations. The Supply System then initiated a review of motor overloads for Class 1E 460 VAC and 125 and 250 VDC motors to identify TOLs that did not satisfy the new selection criteria. The TOLs associated with 93 Class 1E continuous duty motors did not satisfy the new selection criteria.

The TOLs for the motors that did not satisfy the new selection criteria were evaluated to determine if any could have prevented the associated motor from performing its safety function by prematurely tripping under low voltage conditions and LOCA bus loading. The 40 motors identified in Table 1 could have failed to perform their safety function due to undersized TOLs. For this failure mechanism to occur, low voltage conditions just above the undervoltage transfer relay setpoint must be maintained for several minutes coincident with accident conditions that would require the motor to function.

Immediate Corrective Actions

The TOLs for motors identified in Table 1 were replaced, per the new selection criteria, prior to restart from the 1991 refueling outage. The trip margins of the TOLs to the remaining 53 motors are less than the 20 percent required per the new selection criteria. However, all of the TOLs have positive trip margins under low voltage conditions. Therefore, the remaining 53 motors were determined capable of performing their safety function with the existing TOLs. The systems affected are identified in Table 1.

Further Evaluation and Corrective Action

A. Further Evaluation

1. This event is considered reportable per 10 CFR 50.73(a)(2)(v)(A) as a condition that alone could have prevented the fulfillment of the safety function of systems that are needed to shutdown the reactor and maintain it in a safe shutdown condition. The NRC was verbally notified of this condition on February 19, 1992 per 10 CFR 50.72(b)(2)(iii)(A).

2. There were no structures, components, or systems inoperable prior to discovery of the condition which contributed to the condition.

3. The root cause of this condition was **Misapplication of Design Inputs**. The TOL selection criteria used to make the original TOL selection were based on industry standards for continuous duty motors and did not take into account motor operation at low voltage conditions. These selection criteria are inappropriate for motors that have a safety related function in nuclear application. The motor must be allowed to perform its safety function during periods just above the undervoltage transfer relay setpoint.

B. Further Corrective Action

The TOLs to the remaining 53 motors will be evaluated to determine if a 20 percent trip margin is required. Any TOLs determined to require a 20 percent trip margin will be replaced.

Safety Significance

Although multiple systems were affected, the safety significance of this condition associated with the ability of the Plant to reach a safe shutdown condition is considered negligible. The likelihood of a low voltage condition occurring on the network during an accident that would require any of the systems identified above to perform their safety function is considered very low. Sustained low voltage on the network sources has not been observed since Plant startup. In addition, the voltage would have to remain just above the setpoint of the degraded voltage relay for a substantial length of time. TOL relays require 15 to 20 minutes to operate at their trip current value. The bus voltage is unlikely to remain at the critical value for such a length of time. Either

the Plant loading or the network voltage will change during this period. Any dip below the setpoint for 8 seconds would result in transfer of the Class 1E busses to a non-degraded source.

Similar Events

LER 84-013 describes an event in which both Post LOCA Hydrogen Recombiner motors (CAC-HR-1A and CAC-HR-1B) tripped on electrical overload within a few minutes of having been started. This was during system pre-operational testing at elevated containment pressures. Plant was shutdown at the time. The overloads and fuses had been sized for 12 HP, the nameplate data of the motors. During initial design review and testing, the difference between nameplate data and design basis requirements was overlooked, resulting in undersized TOLs.

LER 89-044 describes a condition in which overloads in MC-4A were selected with consideration of the design basis requirements, including low voltage. However, the selection data were incorrectly applied which resulted in undersized thermal overloads. This condition prompted a review of two more motor control centers (MC-7-A-A and MC-8-F), one on each of the two remaining safety related busses. All of the overloads reviewed were found to be correctly sized.

LER 89-044 corrective actions required a general review of the TOL selection criteria. This review determined the criteria did not specifically require consideration of degraded voltage. Without recognition of this requirement, TOLs could be selected to industry standards, resulting in undersized TOLs for Class 1E continuous duty motors. This prompted development of a new selection criteria and review of TOLs for Class 1E motors.

EIIS Information

Text Reference	EIIS Reference System	EIIS Reference Component
Drywell HVAC	V	FU, Fan
Diesel Building HVAC	VJ	FU, Fan
Diesel Lube Oil System	LA	FU, P
Diesel Fuel Oil System	DC	FU, P
Main Steam System	LS	FU, Fan
Reactor Core Isolation Cooling System	BN	FU, P
Reactor Building HVAC	VA	FU, Fan
Radwaste Building HVAC	VA	FU, Fan
Containment Atmosphere Control Center	BB	FU, Fan

Table 1

CLASS 1E MOTORS WITH UNDERSIZED TOLs
THAT WERE REPLACED PER THE REVISED SELECTION CRITERIA
DURING THE 1991 MAINTENANCE OUTAGE

CRA-FN-1A1	DEA-FN-31	DO-P-1A	RRA-FN-15
CRA-FN-1A2	DEA-FN-33	DO-P-1B	RRA-FN-17
CRA-FN-1B1	DEA-FN-52	DO-P-2	RRA-FN-19
CRA-FN-1B2	DLO-P-3A1	FPC-P-1A	RRA-FN-20
CRA-FN-1C1	DLO-P-3A2	FPC-P-1B	RRA-FN-6
CRA-FN-1C2	DLO-P-3B1	MSLC-FN-1	WMA-FN-51A
CRA-FN-2A1	DLO-P-3B2	MSLC-FN-2	WMA-FN-51B
CRA-FN-2A2	DMA-FN-11	RCIC-P-2	WMA-FN-53B
CRA-FN-2B2	DMA-FN-21	RRA-FN-13	WMA-FN-54A
DEA-FN-23	DMA-FN-51	RRA-FN-14	WMA-FN-54B

CRA = CONTAINMENT RETURN AIR SYSTEM
DEA = DIESEL BUILDING EXHAUST AIR (HVAC) SYSTEM
DLO = DIESEL LUBE OIL SYSTEM
DMA = DIESEL BUILDING MIXED AIR (HVAC) SYSTEM
DO = DIESEL FUEL OIL SYSTEM
MSLC = MAIN STEAM LEAKAGE CONTROL SYSTEM
RCIC = REACTOR CORE ISOLATION COOLING SYSTEM
RRA = REACTOR BUILDING RETURN AIR (HVAC) SYSTEM
WMA = WASTE BUILDING MIXED AIR (HVAC) SYSTEM