

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
Washington Nuclear Plant - Unit 2

DOCKET NUMBER (2)

0 5 0 0 0 3 1 9 7 1 OF 0 1 3

TITLE (4)

10CFR Part 21 Report - Incorrect Sizing of Underground Cables

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)						
1	0	0	8	8	6	8	6	0	3	3	0	5	0	0	0	1	1
1	0	0	8	8	6	8	6	0	3	3	0	5	0	0	0	1	1

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)											
POWER LEVEL (10)	1	20.402(b)	20.406(e)	50.73(a)(2)(iv)	73.71(b)								
	1	20.406(a)(1)(i)	50.38(a)(1)	50.73(a)(2)(v)	73.71(e)								
	1	20.406(a)(1)(ii)	50.38(a)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)								
	1	20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Part 21								
	1	20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)									
1	20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)										

LICENSEE CONTACT FOR THIS LER (12)

NAME  
S.L. Washington, Compliance Engineer

TELEPHONE NUMBER

AREA CODE  
5 0 9 3 7 7 - 2 5 0 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) Ext. 2080

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

SUPPLEMENTAL REPORT EXPECTED (14)

X YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR  
0 1 0 9 8 7

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On October 8, 1986, a safety evaluation concluded that the cable derating calculations for the Standby Service Water Pump (SW-P-1A/1B) feeders did not correctly consider the portion of the cables routed in duct banks between the main plant and the Service Water Pump Houses. The cable allowable ampacity was determined as if the cable was routed through cable tray for the total distance; therefore, these cables are undersized. The cable experiences higher temperatures than designed when the Standby Service Water Pumps are running and will deteriorate faster than designed, thus reducing the expected design life. An engineering review is being performed to determine required design changes which will be required to extend the cable life.

Based on conservative time estimates of the Standby Service Water Pump operating history, and observed duct bank temperatures, a safety evaluation determined that this design deficiency will not reduce plant safety margins prior to the next refueling outage scheduled for the Spring of 1987.

This is a special report filed per the requirements of 10CFR Part 21.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Washington Nuclear Plant - Unit 2	0 5 0 0 0 3 9 7 8 6	—	0 3 3	— 0 0 0	2	OF 0 3

TEXT (If more space is required, use additional NRC Form 365A's) (17)

Nature of Defect and Safety Hazard

At 1400 hours on October 8, 1986, a safety evaluation concluded that the calculations made by Burns and Roe (BRI) under Contract 2808 for derating the power feeder cables to the Standby Service Water Pumps (SW-P-1A/1B) are in error. The cables are routed in underground duct banks between the main plant and service water pump houses; however, the cable allowable ampacity was determined using ampacity values for cable routed in open top cable tray for the entire circuit length. Calculations using ampacity values for the service water pump feeder cables in underground duct banks show that the cables are too small. This safety evaluation was initiated because of a power cable failure in a non-safety related circuit in a similarly-designed underground duct bank. A plant review determined that five circuits important to safety are routed in similar underground duct banks. Two of the five circuits are the feeder circuits for the standby service water pumps discussed above. The other three circuits are the feeder circuits for the High Pressure Core Spray Diesel Service Water Pump (HPCS-P-2) and for the Tower Makeup Water Pumps (TMU-P-1A/1B). An evaluation of the derating calculations for these circuits determined their cable ampacity ratings are satisfactory for routing in underground duct banks.

BRI's calculation 2.07.01 stated that the required ampacity to these motors was 278 amps and the 350 MCM cable had an ampacity of 330 amps. The basis of the cable ampacity was IPCEA/NEMA WC51-1972 "Ampacities - Cables in Open - Top Cable Trays". IPCEA Standard P-46-426 "Power Cable Ampacities", rated 350 MCM 8kV triplexed cable at 205 amp when installed in a 30" deep underground duct bank with 9 ducts. The WNP-2 duct bank to the Standby Service Water Pump houses is as deep as 10'4" in the ground. Therefore, the actual cable ampacity will thus be less than identified in the IPCEA standard P-46-426 document.

To determine the ability of the cable to perform its safety function, the cable manufacturer was called and the cable qualification and identification document report was reviewed to determine the maximum temperature the cable could stand for a minimum of 4 years. Four years was chosen since these pumps were placed in service about 3 years ago and WNP-2 is about 6 months from the next outage. Thus the safety requirement, that the pump would have to run for up to an additional 6 months, could be met if the cable could be evaluated as having a four year expected life (three and one half years of operation plus six months reserved for its safety function). This is conservative since the pumps do not run continuously. It is estimated that the pumps run less than 30% of the time. The manufacturer stated that the cable could operate continuously at 120°C (248°F) for 4 years. This information agreed with the cable qualification report. Temperatures of spare ducts in the duct banks for these cables have been measured between 67 - 74°F at the deepest sections without the pumps running, and at 78°F after running the pumps for ten hours. Therefore, these cables will meet their safety requirements until, at least, the next scheduled outage.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED ONS NO. 3185-0104  
EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (3)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
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TEXT (If more space is required, use additional NRC Form 388A's) (17)

Corrective Action

- o The Plant Technical Staff is chairing a committee that has been formed to address the long term resolution of this problem. Corrective action is planned to include cable temperature calculations reflecting actual installation conditions to form a basis for subsequent modifications to ensure long term reliability. A supplemental report with the long term resolution and corrective action plan will be submitted by January 9, 1987.
- o A letter will be transmitted to Burns and Roe Inc. to inform them of our determination and request their further evaluation
- o The Burns and Roe Engineering Criteria Document Section D, Revision 14, is used by Supply System Engineering for new design does not adequately address underground cable installation. This document will be modified to correctly specify the sizing requirements for cables installed in underground duct banks.

Similar Events

LER 84-007, LER 85-001, LER 85-023, LER 86-027, LER 86-028

EIIS Information

<u>Text Reference</u>	<u>System</u>	<u>Component</u>
Standby Service Water Pumps (SW-P-1A/1B)	BS	P
High Pressure Core Spray Diesel Service Water Pump (HPCS-P-2)	BG	P
Tower Makeup Water Pump	KI	P



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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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

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Docket No. 50-397

October 13, 1986

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

Subject: NUCLEAR PLANT NO. 2  
LICENSEE EVENT REPORT NO. 86-033

Dear Sir:

Transmitted herewith is Licensee Event Report No. 86-033 for WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR Part 21 and discusses the item of reportability as required by Section 21.21(b)(3). Verbal notification of this event was made at 1400 hours on October 10, 1986.

Very truly yours,

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

CMP:lc

Enclosure:  
Licensee Event Report No. 86-033

cc: Mr. John B. Martin, NRC - Region V  
Mr. R. T. Dodds, NRC - Site (901A)  
Ms. Dottie Sherman, ANI  
INPO Records Center - Atlanta, GA  
Mr. C. E. Revell, BPA (M/D 399)

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