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April 6, 1992  
ND3MNO:3279

Beaver Valley Power Station, Unit No. 1  
Docket No. 50-334, License No. DPR-66

LER 92-004-00

United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Gentlemen:

In accordance with Appendix A, Beaver Valley Technical Specifications, the following Licensee Event Report is submitted:

LER 92-004-00, 10 CFR 50.73.a.2.i, "Degraded Diesel Generator Ventilation System".

Very truly yours,

*K.L. Ostrowski for*

T. P. Noonan  
General Manager  
Nuclear Operations

DSC/sl

Attachment

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April 6, 1992

ND3MNO:3279

Page two

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April 6, 1992  
ND3MNO:3279  
Page three

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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-510), 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)

Beaver Valley Power Station Unit 1

DOCKET NUMBER (2)

0 5 0 0 0 3 3 4 1 OF 0 4

PAGE (3)

TITLE (4)

Degraded Diesel Generator Ventilation System

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)	
0	3	0	6	9	2	9	2	0	0	4	0 0 0 0 0 0 0 0 0 0	
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)												
OPERATING MODE (9)			20.402(b)			20.405(c)			50.73(a)(2)(iv)			73.71(b)
POWER LEVEL (10)			20.405(a)(1)(i)			50.38(c)(1)			50.73(a)(2)(ix)			73.71(a)
1			20.405(a)(1)(ii)			50.38(c)(2)			50.73(a)(2)(viii)			OTHER (Specify in Abstract below and in Text, NRC Form 366A)
			20.405(a)(1)(iii)			X 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)(ix)(B)			
			20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(ix)			

LICENSEE CONTACT FOR THIS LER (12)

NAME

T.P. Noonan, General Manager Nuclear Operations

TELEPHONE NUMBER

AREA CODE

4 1 2 6 4 3 - 1 2 5 8

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS
B	V J	X X X X	X X X X	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/>	<input type="checkbox"/>				

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

On 3/2/92, a review of an internal safety system functional evaluation audit identified a potential degraded condition associated with the Emergency Diesel Building Exhaust Ventilation System. The thermostat that starts the exhaust fans was not Quality Assurance Category I and could fail during an accident. An engineering evaluation of the Emergency Diesel Building Exhaust Ventilation System was initiated. Additionally, as a conservative measure, the exhaust fan circuits were modified to initiate operation of the exhaust fans on Diesel Generator starts and not rely on the thermostat. These modifications were completed on 3/4/92 and 3/5/92 for train B and train A respectively. On 3/6/92, the results of the formal calculation indicated that if the exhaust fan would not start, maximum allowable outside air temperature would be -12F. Since this temperature had been exceeded in the past, the exhaust ventilation system, a support system for the emergency diesel, was degraded and should have been considered inoperable. Therefore, because the appropriate action statement had not been entered, the plant had operated in a condition prohibited by Technical Specifications.

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 20556, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

PAGE (3)

Beaver Valley Power Station Unit 1

0 5 0 0 0 3 3 4 9 2 - 0 0 4 - 0 0 0 2 OF 0 4

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

Description of Event

On 3/2/92, a review of an internal Electrical Distribution Safety System Function Evaluation (EDSSFE) report identified a potentially degraded condition associated with the Emergency Diesel Building Exhaust Ventilation System. A potentially insufficient ventilation airflow through the diesel generator cubicles could not maintain the cubicles' ambient air temperature at or below the diesel design temperature of 123 degrees Fahrenheit (F) during an extended run of the diesels. The concern involved quality assurance qualification of the thermostats in the exhaust fans' control circuits. These thermostats normally start diesel ventilation exhaust fans when the cubicle ambient temperature exceeds 90 degrees F. The EDSSFE evaluation determined that these thermostats are not Quality Assurance Category I and therefore cannot be relied on during accident conditions. During an accident scenario, if these thermostats malfunction and fail to start the exhaust fans, the available cubicle ventilation flow would be decreased by approximately 28,750 scfm.

Engineering was requested to determine what maximum allowable outside temperature would allow the diesels to be run at full load without their cubicles exceeding the diesels' maximum design temperature of 123 degrees F. This calculation was to be performed twice, using different initial assumptions. The first set of initial conditions assumed the ventilation exhaust fan started and was able to provide cubicle cooling during the accident. The second set of initial conditions assumed that the fan failed to start due to a thermostat failure and provided no cooling during the event.

While these calculations were being performed, the Diesel Generator Start circuits were modified to initiate exhaust fan operation directly whenever the diesel generator starts. These modifications were completed on 3/4/92 and 3/5/92 for train B and train A respectively.

On 3/6/92, engineering calculations determined that if the exhaust fan did not start, the maximum allowable outside air temperature was -12 degrees F (negative 12 degrees F). Calculations also demonstrated that with an operating exhaust fan, the maximum allowable sustained outside air temperature would be 90 degrees F. Engineering has contacted the vendor for additional information and is continuing to evaluate diesel cooling and ventilation requirements.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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FACILITY NAME (1)  Beaver Valley Power Station Unit 1	DOCKET NUMBER (2)  0500033492	LER NUMBER (6)			PAGE (3)  04
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
			004	0003	

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

The ventilation design assumes a maximum outside ambient temperature of 90 degrees Fahrenheit. Diesel ventilation is sized so the diesel cubicle temperature will not exceed 123 degrees F during extended diesel full power operation. Historical data shows that local ambient air temperature is expected to exceed 90 degrees F for approximately 30 hours per year. However, when the actual daily temperature profile (hot during the day, cool during the night), is allowed for in this ventilation flow and temperature calculation, the two foot thick concrete diesel cubicle walls act as a significant heat sink and provide additional cooling to the diesel cubicle during an accident. When this additional heat sink induced cooling was accounted for, Engineering verified that the diesel cubicles would remain below 123 degrees F during all accident conditions.

Cause of Event

This event was due to a ventilation system design deficiency during original plant construction.

Corrective Actions

The following corrective actions have been taken:

1. The emergency diesels ventilation exhaust fan start circuits were modified to initiate exhaust fan operation whenever its associated diesel generator starts. The fan start signal is now actuated via a set of spare contacts in the diesel start circuit. The entire circuit is now Quality Assurance Category I. This design ensures that whenever a diesel is operating, its ventilation system will be in service.
2. An engineering analysis of historical temperature data and diesel cubicle design verified that the present ventilation configuration and flow will maintain the diesel below 123 degrees F during all accident conditions.
3. The original thermostats will be replaced with Quality Assurance Category I rated thermostats.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 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)

DOCKET NUMBER (2)

LER NUMBER (8)

PAGE (3)

YEAR	SEQUENTIAL NUMBER	REVISION NUMBER

Beaver Valley Power Station Unit 1

0 5 0 0 0 3 3 4 9 2 - 0 0 4 - 0 0 0 4 OF 0 4

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

Reportability

This report is being submitted in accordance with 10CFR50.73.a.2.i.B as a condition prohibited by the plant's Technical Specifications.

Previous Similar Events

Review of station records showed one previous event (Unit 2 LER 90-018) involving a diesel generator ventilation fan circuitry design problem. This problem involved the lack of a seal-in feature on the fans' start signal.

Safety Implications

There were no safety implications due to this event. In the event of an accident, in addition to the diesels, two independent trains of offsite power are available to supply all safety related loads. If both trains of offsite power and both diesels are unavailable, the station's emergency procedures provide the operators with mitigation and recovery instructions.

In the event of a thermostat failure resulting in insufficient diesel cubicle ventilation flow, manual operation of the fans would still be available. The above referenced emergency procedure sends operators to the diesel cubicles and directs them to attempt to locally recover a failed diesel. Using the local control switch, operators would have been able to start the exhaust fans and restore full diesel ventilation.