

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 2 6 9 1	PAGE (3) 1 OF 0 3
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TITLE (4)  
Failure of E. S. Power Supply

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	1	1	8	5	8	5	0	0	1	0	2	2	0	5	0	0	0
0	1	1	8	5	8	5	0	0	1	0	2	2	0	5	0	0	0

OPERATING MODE (9)	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	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)							
	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(e)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)							
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(e)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract Below and in Text, NRC Form 366A)							
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	50.72(b)(1)(i)(A)							
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)								
<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)									

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME	AREA CODE	TELEPHONE NUMBER	
Richard F. Haynes, Licensing	7 0 4	3 7 3 1 - 7 1 1 2 1 9	

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

CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPROS
X	J	E	J	X					
			B	0	4	5			Y

SUPPLEMENTAL REPORT EXPECTED (14)	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO			

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

Oconee Unit 1 was operating at 100% full power on January 11, 1985 at 0920 hours, when a power supply in one of the Engineered Safeguards (ES) Protection System cabinets was lost due to a failed component in its circuitry. Because the affected power supply served portions of subsystems in another cabinet, one of the two trains of ES systems (HPI, LPI, RBS, and RBCU) was rendered inoperable.

The availability of only one ES train placed the unit under a Limiting Condition for Operation (LCO) pursuant to Technical Specification (T.S.) 3.5.1; accordingly, Unit 1 began power reduction. Shortly thereafter, the problem was diagnosed, and repair was completed. The unit was subsequently returned to full power by 2209 hours, following additional unrelated tests.

Further corrective action will consist of obtaining the required number of replacement components, of the type which failed, and installing them into other similar power supplies during upcoming scheduled outages. This should reduce the likelihood of a reoccurrence of this event in the future.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Oconee Nuclear Station, Unit 1	0   5   0   0   0   2   6   9   8   5	-	0   0   1	-	0   1	0   2 OF 0   3

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

Description of Occurrence:

On January 11, 1985 at 0920 hours, while Oconee Unit 1 was operating at 100% full power, a 15 volt power supply in the Engineered Safeguards Protection System (ESPS) Channel "B" Analog Cabinet failed. The failure resulted in the loss of power to Analog Channel "B" (Analog Subsystem 2 in the Oconee FSAR, Figure 7.3-1). Because the even numbered digital logic controllers are dependent upon this same power supply for their function, the automatic actuation feature of channels 2, 4, 6, and 8 (associated with the second of the two ES trains) was also made inoperable.

Initial indication of the problem resulted from the activation of two statalarms at 0920 hours in the control room. One of these cleared immediately, but the resetting of a tripped bistable (at 0927 hours) in the ESPS cabinet was necessary to clear the other alarm. When the same alarms were reactivated at 0930 hours, the problem was investigated and the discovery of the malfunctioning power supply was made. The removal of AC power to the failed power supply at 1042 hours, which was required in order to effect repair, also removed from service the Loop "A" wide range pressure indication making the Loop "A" and Core Saturation Monitors inoperable.

The LCO imposed by T. S. 3.5.1, because of only one Digital Logic Subsystem being operable, required the unit to be in a hot shutdown condition within 12 hours after the event. Accordingly, power reduction was begun at a rate of 10% per hour at 1042 hours. Once the power supply had been replaced, power reduction was terminated at approximately 95%. Power was later reduced further to 86%, so as to perform tests which were not connected with the occurrence of this event. Unit 1 was then returned to 100% full power by 2209 hours.

Cause of Occurrence:

The loss of the ES Channel "B" Analog Cabinet power supply was caused by the failure of an electrolytic capacitor in its internal circuitry. This type of failure has not been a recurring problem.

Analysis of Occurrence:

The ES system at Oconee was designed in accordance with IEEE standard #279 dated 1971. One of the requirements of this standard is that the system in question be single failure proof, i.e. no single failure will prevent this system from performing its intended function. Another requirement of this standard is independence, which requires that redundant trains of a safety system be electrically and physically independent. This implies that a failure in one train will not affect the other train's ability to perform its intended function. Details of the ESPS are given in the Oconee FSAR Section 7.3.2 and 7.3.3 as well as in Figure 7.3-1.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)  Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2)  0   5   0   0   0   2   6   9   8   5	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
			-   0   0   1	-   0   1	0   3	OF	0   3

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

The failure of the power supply caused the loss of Analog Channel "B" which is the output corresponding to Analog Subsystem 2 in FSAR Figure 7.3-1. However, the channel failed in a tripped state, so that its safety function was unimpeded. Because of this, one of the three inputs to each of the eight digital logic controllers was in a tripped state. Therefore, the loss of Analog Channel "B", in itself, did not affect the availability of either ESPS Digital Logic Subsystem.

However, the loss of the Analog Channel "B" (Analog Subsystem 2 - FSAR Figure 7.3-1) cabinet power supply did affect the availability of the even numbered Digital Logic Subsystem. The reason for this was that the power supply also fed the even numbered digital logic controllers (in Digital Logic Subsystem 2 - FSAR Figure 7.3-1). Consequently the power supply failure resulted in the disabling of all four digital logic controllers, and the effective loss of Digital Logic Subsystem 2. Automatic actuation of the associated ES train, therefore, could not have occurred.

In a similar manner, the other ES train, associated with the odd numbered digital logic controllers (in Digital Logic Subsystem 1 - FSAR Figure 7.3-1) was unaffected, since its logic controllers are supplied DC power from the Analog Channel "A" cabinet power supply (Analog Subsystem 1 - FSAR Figure 7.3-1). Since this ES Train would have been available in the event ES actuation was required, it is concluded that the health and safety of the public were not affected by this incident.

Corrective Action:

The immediate corrective action undertaken was to reduce power at such a rate so as to attain hot shutdown within the interval specified by the LCO (T.S. 3.5.1). Subsequently, the source of the problem was isolated, and the affected power supply was replaced, enabling Unit 1 to be brought back to 100% full power.

Additionally, electrolytic capacitors, of the type which failed, were ordered so that replacement can be accomplished in other similar RPS and ESPS power supplies during upcoming outages, for all three units.

**DUKE POWER COMPANY**

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VICE PRESIDENT  
NUCLEAR PRODUCTION

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February 20, 1985

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

Subject: Oconee Nuclear Station, Unit 1  
Docket No. 50-269  
LER 269/85-01

Gentlemen:

By a letter dated February 11, 1985, Duke Power submitted Licensee Event Report (LER) 269/85-01 which concerned an incident involving the failure of an Engineered Safeguards Protection System cabinet power supply; this LER described an event considered to be of no significance with respect to the health and safety of the public.

Subsequently, a minor change in the sequence of events, as discussed in the report, now requires that the report be revised. Accordingly, please find attached the revised LER 269/85-01, which Duke is resubmitting in its entirety for purposes of clarity.

Very truly yours,

*H.B. Tucker / HBS*

Hal B. Tucker

RFH:slb

Attachment

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