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 AUTH. NAME AUTHOR AFFILIATION
 LOWERY, H.R. Duke Power Co.
 TUCKMAN, M.S. Duke Power Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 89-009-00: on 890607, mgt deficiency resulted in incorrect
 TS which allowed SBF to prevent EPSL from functioning.

W/8 ltr.

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Duke Power Company
Oconee Nuclear Station
P.O. Box 1439
Seneca, S.C. 29679

(803) 882-5363



DUKE POWER

July 6, 1989

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

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
LER 269/89-09

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report (LER) 269/89-09. This report concerns inadequate Technical Specification 3.7.1.b.1 which allowed unrestricted plant operation in a configuration which could allow a single failure of one standby breaker to prevent Emergency Power Switching Logic from performing its function under certain accident scenarios. This was discovered during Design Engineering reviews for the Design Basis Documentation Analysis.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(vii)(b). This event is considered to be of no significance with respect to the health and safety of the public.

This report will have a supplement.

Very truly yours,

M. S. Tuckman

M. S. Tuckman
Station Manager

SWB

Attachment

xc: Mr. S. B. Ebnetter
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta St., NW, Suite 2900
Atlanta, Georgia 30323

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Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

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Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

Mr. P.H. Skinner
NRC Resident Inspector
Oconee Nuclear Station

M&M Nuclear Consultants
1221 Avenue of the Americas
New York, NY 10020

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Oconee Nuclear Station, Unit 1	DOCKET NUMBER (2) 050000269	PAGE (3) 1 OF 06
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TITLE (4) A Management deficiency resulted in an incorrect Technical Specification which allowed a Single Breaker Failure to prevent the Emergency Power Switching Logic from Functioning

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)
06	07	89	89	009	00	07	07	89	Oconee, Unit 2		0500002710
									Oconee, Unit 3		050000287

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9) N	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(e)	<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"/> 50.38(a)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(e)
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.38(a)(2)	<input checked="" type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)
	<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)	
	<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)

NAME Henry R. Lowery, Oconee Safety Review Group	TELEPHONE NUMBER	
	AREA CODE 81013	81851-1310134

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)

YES (If yes, complete EXPECTED SUBMISSION DATE)

NO

EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	08	01	89

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

On June 7, 1989, at 1400 hours, with Units 1 and 3 operating at 100% full power and Unit 2 in a refueling outage, it was discovered that Technical Specification 3.7.1.b.1 allowed unrestricted plant operation in a configuration which could allow a single failure of one standby breaker to prevent the Emergency Power Switching Logic (EPSL) System from performing its function under certain accident scenarios. This discovery was made during Design Engineering reviews for the Design Basis Documentation Analysis. The root cause of this event was management deficiency which resulted in an inadequate Technical Specification. The immediate corrective actions consisted of maintaining both Standby Buses operable. In the event that one of the Standby Buses became inoperable, then Technical Specification 3.7.2.a would apply and all Oconee units would enter a 72 hour Limiting Condition of Operation. Subsequent investigation found procedural deficiencies in the operating procedures which would prevent EPSL from performing its function. Procedures were reissued to correct these problems.

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		YEAR 8 9	SEQUENTIAL NUMBER - 0 0 9	REVISION NUMBER - 0 0		

TEXT (if more space is required, use additional NRC Form 388A's) (17)

BACKGROUND

The Emergency Power Switching Logic (EPSL) [EIIS:EK] in conjunction with its associated circuits, provides a means for assuring that power is supplied to the Main Feeder Buses [EIIS:EA] and therefore to the essential plant loads under accident conditions. EPSL monitors the normal and emergency power sources and upon loss of the normal power source, EPSL will seek an alternate source of power. The first priority as the alternate power source is the unit startup transformer [EIIS:XFMR] powered from the plant switchyard. The second is from an emergency power source, the first Keowee hydro unit, via the 230 kV overhead feeder through the startup transformer. In the event the startup source is not available, EPSL will select the standby as the alternate power source with power provided from an emergency power source, the second Keowee hydro unit, via the 13.8 kV underground feeder and through the CT-4 transformer. In the event that the Keowee Hydro units are unavailable for the supply of emergency power, gas turbines at the Lee Steam Station are lined up, via a dedicated transmission line, to supply power to the Standby Buses at Oconee through the CT-5 transformer. If none of the alternate power sources are available, EPSL waits until power is available at one of the sources and then selects that source as the emergency power supply. EPSL will sense that the standby source is an available power source if there is an energized path from either Keowee hydro station or the Lee gas turbines regardless of the state of the Standby Bus breakers (S1 and S2).

Technical Specification 3.7 delineates the requirements for auxiliary electrical systems. Section 3.7.1.b states: "Two independent on-site emergency power paths shall be operable and shall consist of:

1. One Keowee hydro unit; through the underground feeder path; through transformer CT4; and to one 4160V Standby Bus.
2. The second Keowee hydro unit; through the Keowee main step-up transformer; through the overhead path and breaker PCB9; the 230 kV switchyard yellow bus and safety related PCB-18, -27, or -30; through the respective operating unit's startup transformer (CT-1, 2, or 3) or the aligned and connected alternate startup transformer. One startup transformer may not be aligned to supply power to more than one unit."

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TEXT (If more space is required, use additional NRC Form 308A's) (17)

EVENT DESCRIPTION

In June of 1973, Technical Specification 3.7, "Auxiliary Electrical Systems", was issued for Oconee Nuclear Station in final form for beginning operation of Unit 1. Technical Specification 3.7.1.c stated that two 4160 volt Standby Buses [EHS:BJ] were required to be operable. This was required as part of the emergency power path from the Kecwee hydro unit through the underground feeder to the transformer and to the Main Feeder buses.

Technical Specification 3.7 required two operable Standby Buses until May 2, 1978. At this time, Amendments Nos. 82, 82, and 79 for Licenses DPR-38, Oconee Unit 1, DPR-47, Oconee Unit 2, and DPR-55, Oconee Unit 3, were issued. This Amendment to Technical Specification 3.7 changed the number of operable Standby Buses from two to one and moved this requirement to 3.7.1.b.

In 1988 work on a draft Technical Specification change was introduced as a result of LER 269/87-09, "Two Functional Units of Emergency Power Switching Logic Taken Out of Service Due to a Management Deficiency". This report resulted in a commitment to resolve a conflict existing in Technical Specification 3.7 which allowed one Standby Bus to be inoperable per 3.7.1.b even though Table 3.7-1 required you to have two operable Standby Buses. The commitment was to have the General Office Licensing group submit a change to 3.7 which would allow one Standby Bus to be removed from service. The initial draft of this Technical Specification revision changed the number of operable Standby Buses from one to two due to the Design Engineering concerns that the startup breakers could be overdutied under certain accident scenarios. This was later found not to be a concern and the number of required operable Standby Buses were revised from two to one on the draft Technical Specification. These draft changes to the Technical Specification are documented in letters between the General Office Licensing group, the Station Compliance group, and Design Engineering from September, 1988 to April 10, 1989. The proposed Technical Specification change was sent to the Nuclear Regulatory Commission on May 12, 1989.

On June 7, 1989, during a Design Basis Documentation Analysis, it was discovered that Technical Specification 3.7.1.b, as presently written requiring one operable Standby Bus, allowed a single failure of the single operable Standby Bus breaker to prevent the Emergency Power Switching Logic (EPSL) from selecting a viable power source under certain accident scenarios. The EPSL senses a viable power path through sensing circuits which register voltage on a path on the transformer side of the Standby Bus breakers. By requiring only one standby breaker operable, this

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TEXT (If more space is required, use additional NRC Form 306A's/117)

provided the possibility for one breaker being out of service without any limiting condition of operation. If this were the initial conditions and the plant had a simultaneous occurrence of a Loss of Offsite Power (LOOP) and a Loss of Coolant Accident (LOCA) on one unit, the failure of the remaining standby breaker would result in the EPSL sensing voltage on the Standby Bus and not swapping to an alternate power path. This would result in power being lost to the Main Feeder bus which would prevent electrical equipment needed to mitigate the consequences of an accident from functioning.

The immediate corrective actions taken to prevent this scenario were to maintain both Standby Buses operable. In the event that one of the Standby Buses were to become inoperable, Technical Specification 3.7.2.a would apply which would place all Oconee units under a 72 hour limiting condition of operation.

Investigations initiated after the discovery of the single failure concerns discovered several operating procedures with procedural deficiencies which placed the plant in a condition where EPSL would not have performed its function. As a result of LER 269/88-13, "Emergency Backup Power Via Lee Gas Turbines Found to Be Unacceptable in Certain Accident Scenarios Due to a Design Deficiency", operating procedures were revised to place the standby breaker control switches in the manual position when it was required for the Standby Buses to be energized from the Lee gas turbines. This action was taken to allow manual sequencing of the loads onto Lee and prevent an undervoltage from occurring. This was necessary since the Lee gas turbines could not support the startup loads occurring during an automatic swap. With the control switches in manual, EPSL would not have been able to automatically close the standby breakers to supply emergency power if it became necessary. These procedural deficiencies were corrected and the procedures were reissued. Operations also generated Training Package 89-21 which explained the need to maintain both Standby Buses operable and the changes which were incorporated into the reissued operating procedures.

CONCLUSION

It is concluded that the root cause of this incident is management deficiency. The Technical Specification was initially issued requiring the operability of two Standby Buses. A 1978 revision changed this requirement to one operable Standby Bus, however, the General Office Licensing group could not locate documentation which explained why this change was initiated. The justification was not adequate since the fact that the single failure of the remaining standby breaker could prevent

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TEXT (If more space is required, use additional NRC Form 388A's (17))

operation of the Emergency Power Switching Logic, thereby violating single failure criteria, was not recognized and the specification was revised to require only one operable Standby Bus. Based on the above reasoning, the root cause of this event is listed as management deficiency which resulted in an inadequate Technical Specification.

The Technical Specification change which was being pursued as a result of LER 269/87-09 initially changed this requirement back to two operable Standby Buses because of Design Engineering concerns about overdutying the startup breakers. When Design Engineering concerns were resolved a revision to the draft Technical Specification changed this requirement back to one operable Standby Bus. The draft Technical Specification changes and proposed Technical Specification changes are reviewed by General Office Licensing, Station personnel, and Design Engineering. This was a missed opportunity to correct this problem since each of these groups failed to recognize that a single failure of the standby breakers could result in preventing the Emergency Power Switching Logic from performing its intended function.

This event was discovered by the Design Engineering Department during the Design Basis Documentation Analysis of the Emergency Power Switching Logic system. This is a project by which Design Engineering is reviewing the design bases of all Safety Related and Technical Specification related systems at Oconee and preparing a Design Basis Manual which will be issued as a controlled document at the end of the analysis. Duke Power is performing a Self Initiated Technical Audit of the Emergency Power Switching Logic system which will be completed in 1989. The Design Basis Manual will provide a means to ensure that all scenarios are reviewed prior to Technical Specifications being revised in the future and prevent the submittal of inadequate specifications. As a result of this incident, a Task Force was formed to review Technical Specification 3.7. This Task Force will consist of Design Engineering, General Office Licensing, General Office Maintenance and Station personnel.

This event is not NPRDS reportable. A review of events within the last year did not reveal any similar events, therefore this event is listed as nonrecurring. This event is the latest in a series of events which have occurred as a result of the added emphasis on the Emergency Power Switching Logic system. The Self Initiated Technical Audit and Design Bases Documentation Analysis will resolve problems and prevent the occurrence of these problems in the future. There were no radioactive material releases, personnel injuries, or radiation exposures as a result of this event, therefore the health and safety of the public was not affected by this event.

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TEXT in more space is required, use additional NRC Form 306A's (17)

CORRECTIVE ACTIONS

Immediate

1. Operations included the requirement to maintain two operable Standby Buses on the shift turnover sheets.
2. Operations will place all Oconee units in a 72 hour limiting condition of operation if one Standby Bus becomes inoperable.

Subsequent

1. Operations reviewed operating procedures and past history for occurrences of one Standby Bus inoperability.
2. A Task Force was formed to review Technical Specification 3.7 and resolve problems.
3. Operating procedure deficiencies were identified and corrected.
4. Operations generated Training Package 89-21.

Planned

1. Compliance will pursue changing Technical Specification 3.7.1.b to require operability of two Standby Buses.
2. Compliance will pursue changing item 4 of Table 8.3-2 of the Final Safety Analysis Report as necessary.
3. Operations will generate procedures for the removal of the Standby Buses from service.
4. Operations will have Design Engineering review operating procedures which are used to remove buses from service.
5. Compliance will incorporate changes discovered as a result of the Task Force into Technical Specification 3.7.

Recommended

None

SAFETY ANALYSIS

The Safety Analysis for this Licensee Event Report will be included on a later supplement to the report.