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 50-270 Oconee Nuclear Station, Unit 2, Duke Power Co.      05000270  
 50-287 Oconee Nuclear Station, Unit 3, Duke Power Co.      05000287

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 RECIPIENT NAME      RECIPIENT AFFILIATION  
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SUBJECT: Responds to NRC 890228 ltr re violations noted in Insp Repts  
 50-269/88-34, 50-270/88-34 & 50-287/88-34.

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**DUKE POWER**

March 31, 1989

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

Subject: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287  
Inspection Report 50-269, -270, -287/88-34  
Violation Response

Gentlemen:

Please find attached my response to the subject Notice of Violation dated February 28, 1989 concerning inadequate design analysis of the emergency backup power supply at Oconee Nuclear Station.

Very truly yours,

Hal B. Tucker

RRE/31/td

Attachment

cc: Mr. S. D. Ebnetter  
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Attachment 1

Duke Power Company  
Oconee Nuclear Station

Reply to a Notice of Violation  
Inspection Report Nos. 50-269/88-34, 50-270/88-34, and 50-287/88-34

Violation, Severity Level III (Supplement I):

10 CFR 50, Appendix B, Criterion III, Design Control, requires that measures be established to ensure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, following the addition of the Motor Driven Emergency Feedwater Pumps to the emergency power system in 1979, the licensee failed to ensure that design specifications and calculations were adequate to demonstrate sufficient capacity and capability of the Lee Station gas turbines to provide power to the emergency bus for all postulated accidents.

On October 17, 1988, Duke Power Company (DPC) Design Engineering (DE) identified by calculations that the voltage levels on the standby bus when powered from the Lee Station were inadequate under certain postulated accident conditions. Inadequate voltage levels could result in the tripping of some safety-related equipment due to overcurrent conditions while starting or potentially cause safety-related motor damage.

Response:

**(1) Admission or denial of the violation:**

Duke Power Company admits the violation occurred as stated above.

**(2) The reasons for the violation if admitted:**

The reason for the violation was determined to be a design deficiency due to the failure of Design Engineering (DE) to adequately analyze the effect of adding the Motor Driven Emergency Feedwater Pumps (MDEFWP) to the emergency power system. DE calculations, performed after the discovery of the Standby Bus voltage degradation problem, indicated that adequate voltage existed on the Standby Buses prior to the addition of the MDEFWP's. After the addition of the MDEFWP's Standby Buses voltage (when powered via the Lee gas turbines), would by analysis degrade to an unacceptable level during certain LOOP and LOCA/LOOP scenarios. No Standby Bus transient voltage profile calculations were performed when the MDEFWP's were added.

A contributing cause to this event was the failure of DE to document analysis of the voltage profile, during original design, of the Standby Buses when powered from Lee gas Turbines. No documentation could be located which indicated that DE assessed the voltage drop on the Standby Buses during transient emergency power situations. This voltage drop aspect may have been considered in the original design; however, it is not documented.

**(3) The corrective steps which have been taken and the results achieved:**

Upon identification of the problem the Lee gas turbines were immediately declared inoperable and operating instructions were issued to operation shift supervisors regarding Lee gas turbines unavailability. The loss of power and the 100KV Power Supply procedures were revised to give guidance for operation when the Standby Buses were required to be energized via the Lee gas turbines.

Additionally a modification for all three Units has been designed. This modification has been implemented and tested on Unit 1 during the end of cycle (EOC) 11 refueling outage which began January, 1989. This modification when fully implemented for all three Units will provide assurance that the loading on the Standby Bus, when the bus is powered by a Lee gas turbine, is such that the voltage is adequate for all postulated design basis events.

Furthermore, the program TOPFORM (The Overall Plan For Organizational Review of Modifications), implemented in 1987, provides enhanced design processes that ensure periodic review of calculations, more cross disciplinary reviews of design changes, enhanced design documentation and an evaluation of the interaction between systems and components when modifications are performed. In addition, the utilization of self-evaluation such as the Self-Initiated Technical Audits (SITA) will provide further assurance that Design Bases are not violated.

**(4) The corrective steps which will be taken to avoid further violation:**

The proposed modification that has been implemented and tested on Unit 1 will be implemented and tested for Units 2 and 3.

**(5) The date when full compliance will be achieved:**

The end of the next Unit 2 refueling outage which is currently scheduled to begin July 3, 1989.