Docket

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 20, 1978

Dockets Nos.: 50-269
50-270
and 50-287

Mr. William O. Parker, Jr.
Vice President - Steam Production
Duke Power Company
422 South Church Street
Charlotte, North Carolina 28242

Dear Mr. Parker:

By our letter dated June 3, 1977, we requested you to assess the susceptibility of the Class IE safety related electrical equipment to: (1) sustained degradation voltage conditions at the offsite power supply and (2) interaction between the offsite and onsite emergency power systems. By letters dated July 21, 1977 and October 7, 1977, you submitted the detail design of the Oconee Nuclear Station's emergency power systems.

The Oconee Nuclear Station originally had an undervoltage protection design to protect the Class IE equipment from a loss of voltage or a sustained degradation of grid voltage on the emergency buses. The protection system includes undervoltage relays with inverse time characteristics which have a trip setpoint set at 88% of the rated bus voltage, i.e., 4160 volts and with a five second time delay. This undervoltage protection design provides for two out of three coincident logic, monitoring the offsite power voltage on each 4160 volt bus. The undervoltage protection will initiate separation of the onsite emergency buses from the offsite power systems immediately upon complete loss of offsite power or at a time delay depending on the extent of the degraded voltage condition below 88% of nominal voltage. The lower the voltage the faster the trip.

For the conditions when the emergency buses must be separated from the offsite power systems due to a degraded voltage condition, the emergency buses are supplied power from the Keowee Hydro Station. The two 87.5 MVA hydroelectric generating units, power transmission systems (overhead and underground), and the transformers and circuits have adequate capabilities to serve the emergency buses with an acceptable voltage and therefore, no load shedding nor sequencing of the emergency loads are required.

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In addition, we have determined through discussions with your staff that you have performed an acceptable voltage drop calculation of the 4160 volt and the 600 volt buses of the onsite system. As a result of your analysis, the transient (inrush) voltages were calculated to be 89% of the rated voltage on the 4160 volt bus and 82% of the rated voltage on the 600 volt bus. This voltage calculation was based on the assumptions of automatic transfer of plant loads from the unit auxiliary transformer to the start-up transformer or to the Keowee Hydro units and with the worst case of allowable combination loading. The voltage levels are adequate for starting all the engineered safety feature (ESF) loads when being started from either the start-up transformer or the Keowee Hydro units.

We have completed our review of the existing system design and have determined that the design affords adequate protection against degraded grid undervoltage conditions in accordance with the NRC letter of June 3, 1977, and is therefore acceptable.

Sincerely,

Morton B. Fairtile for

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

cc: See next page

Duke Power Company

cc:
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