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 TUCKER,H.B. Duke Power Co.
 RECIP.NAME RECIPIENT AFFILIATION
 DENTON,H.R. Office of Nuclear Reactor Regulation, Director
 STOLZ,J.F. Operating Reactors Branch 4

SUBJECT: Requests withdrawal of 831111 application for exemption from Section III.G.2 of 10CFR50.48, App R. Mockup of fire barrier wall separating east & west penetration rooms demonstrated compliance w/fire endurance requirements.

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September 30, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Mr. J. F. Stolz, Chief
Operating Reactors Branch No. 4

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Sir:

By letter dated November 11, 1983, Duke Power Company (Duke) requested an exemption to 10 CFR 50 §50.48 Appendix R Section III.G.2. Specifically the exemption concerned the fire barrier wall separating the east and west penetrations rooms at Oconee Nuclear Station. In subsequent discussions with members of your staff concerning this matter, Duke agreed to perform a test of a "mock-up" of the wall to qualify it as a three-hour fire rated barriers.

Further, by letter dated February 28, 1985, Duke advised the NRC that exemption requests 1 and 2 of the November 11, 1983 letter would be formally withdrawn congruant with the completion of the test and favorable evaluation of the test results.

Briefly, the wall and associated penetration seals are to meet the following requirements:

- A) Walls must have three-hour fire rating when tested to ASTM-E119 Time Temperature Curve. The governing failure criteria is an average cold-side temperature rise of more than 250° F above ambient.
- B) Penetrations seal requirements are as stated in Appendix R, Section M, "Fire Barrier Cable Penetration Seal Qualification," which states:

"Penetration seal designs shall use only non-combustible material and shall be qualified by tests that are comparable to tests used to rate fire barriers. The acceptance criteria for the tests shall include:

- 1) The cable fire barrier penetration seal has withstood the fire endurance test without passage of flame or ignition of cables on the unexposed side for a period of time equivalent to the fire resistance rating required of the barrier;

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Mr. Harold R. Denton, Director

September 30, 1985

Page Two

- 2) The temperature levels recorded for the unexposed side are analyzed and demonstrate that the maximum temperature is sufficiently below the cable insulation ignition temperature; and
- 3) The fire barrier penetration seal remains intact and does not allow projection of water beyond the unexposed surface during cold stream test."

Duke has been advised that the cable insulation ignition temperature is approximately 735°F. Based on this criteria and the results of the test, Duke concludes the following:

- 1) Thermocouples embedded on electrical cable conductors record that maximum temperature of about 406°F (208°C) at the end of three hours which is well below the stated criteria.
- 2) Thermocouples on the cold-side surface of 4" and 12" diameter pipes recorded temperatures of 518°F (215°C) and 741°F (394°C), respectively, at the end of three hours. Temperature on the cold-side surface of the 12" pipe exceeded 735°F at two hours and fifty-five minutes.

Since there is no combustible material on pipe surfaces, this temperature is not relevant. In addition, fluids in pipes would act as a heat sink resulting in appreciably lower temperature on the cold-side pipe surface.

- 3) Thermocouples located 1" from the 4" and 12" diameter pipes on the cold-side surface of the penetration seals recorded temperatures of 419°F (215°C) and 496°F (258°C), respectively, at the end of three hours. Again, fluid in the pipe would act as a heat sink and substantially reduce the temperature of a similar condition in the station.
- 4) Thermocouples on the wall surface record a maximum temperature of 282°F (139°C) at the end of three hours.

This confirms that the composite assembly meets the requirements as stated in Appendix R.

In summary, the "mock'up" wall demonstrated a fire endurance classification of three hours thirty-six minutes in accordance with the standard methods of five tests of Building Construction and Materials, ASTM Designation E 119-83. In addition the assembly incorporated three through penetrations fire stops.

Mr. Harold R. Denton, Director

September 30, 1985

Page Three

The fire stops were evaluated in accordance with standard methods of fire tests of through-penetration fire stops, ASTM Designation E 814-83. Inasmuch as the configuration has been explicitly tested, Duke request that exemption requests 1 and 2 of the November 11, 1983 letter be withdrawn.

Very truly yours,



Hal B. Tucker

PFG:slb

cc: Mr. J. C. Bryant
NRC Resident Inspector
Oconee Nuclear Station

Ms. Helen Nicolaras
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