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AUG 6 - 1970

Dr. Joseph M. Hendrie
Chairman, Advisory Committee
on Reactor Safeguards
U.S. Atomic Energy Commission
Washington, D.C. 20545

Dear Dr. Hendrie:

Eighteen copies of a replacement page 17 to the report to the ACRS by the Division of Reactor Licensing dated July 24, 1970 are enclosed for your distribution to the recipients of the original report concerning the Duke Power Company's Oconee Nuclear Station Units 1, 2, and 3.

Sincerely,

Peter A. Morris, Director
Division of Reactor Licensing

Enclosure:
Report to ACRS

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3.2.2 Reactivity Calculations

The applicant has described the computer programs and calculational techniques used by B&W to predict the nuclear characteristics of the reactor designs, and has provided examples to demonstrate the ability of these methods to predict UO_2 and $P_u O_2 - UO_2$ critical assemblies. We concur that these examples demonstrate the validity of the methods used to predict k_{eff} for the large power reactor cores.

Detailed three-dimensional power distribution measurements have been performed by B&W at the Babcock & Wilcox Critical Experiments Laboratory. Results of the applicant's calculations using PDQ07, a three-dimensional program, agree quite well with the measured power distributions. The B&W version of PDQ07 used for the calculations incorporates a thermal feedback option, permitting accurate descriptions to be made of the radial and axial power distributions in analyses of control rod maneuvering, xenon stability status and control, and reactivity coefficients. These distributions are needed to evaluate core thermal margins.

The applicant has also performed analyses, using a two-dimensional PDQ program in conjunction with fuel cycle calculations obtained with the use of the HARMONY program, to provide estimates of core fuel burnups and first and second cycle and equilibrium core enrichments.

We have concluded that the material presented adequately demonstrates B&W's ability to predict the physics characteristics of the reactors.

3.2.3 Reactivity Control Requirements

The applicant has provided substantial information supporting his ability to control the excess reactivity provided in the reactors and maintain a shutdown margin to hot critical of at least 1% $\Delta k/k$ throughout core life with the most reactive control rod stuck out of the core. Sixty-one full-length control rods are provided. This is greater than the number provided in other PWR designs. The predicted worth of 12.1% $\Delta k/k$ for Oconee 1, is also greater than the worth usually provided. For 90% of the fuel cycle in Oconee 1, 1.0 to 1.3% of the control rod worth will be used for partial