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May 18, 1967

OCONEE ACRS REPORT - NEUTRON EXPOSURE OF REACTOR VESSEL
 C&CTB:DRL:SSP KI-22

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We have reviewed the calculated fast neutron exposure of the Oconee reactor vessel and the corresponding shift in the NDT temperature. The reported time-integrated fast ($E > 1$ Mev) neutron exposure of the vessel of 3×10^{19} , and the estimated NDT temperature shift of 260°F , should not cause any significant operational restrictions during proposed life of the plant.

The neutron exposure of the vessel of 3×10^{19} was calculated over a 40 year life of the vessel using an 80 percent load factor and the maximum axial peak-to-average power ratio of 1.7. The calculations were performed using a transport code, TOPIC, which is an S_0 code designed to solve the one-dimensional transport equation in cylindrical coordinates. We do not consider the calculational method employed to be entirely satisfactory, mainly because only four neutron energy groups were used to describe the neutron energy spectrum, and only four intervals were used in the S_0 calculations to describe the angular segmentation of the flux. Nevertheless, a sufficiently high safety factor has been applied to the calculations to make them conservative. We reached this conclusion after consideration of the Oconee plant core size, power density, and the inner diameter of the reactor vessel.

We have reviewed the thickness and location of the thermal shield inside the reactor vessel and have found it adequate.

With respect to the surveillance program for the reactor vessel material, we have asked the applicant to provide us with the type of neutron flux monitors which will be used in the irradiation capsules, and with the method which will be employed to determine neutron flux of the irradiation samples.

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