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U. S. ATOMIC ENERGY COMMISSION

DIVISION OF REACTOR LICENSING

REPORT TO THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

IN THE MATTER OF

PRELIMINARY ASPECTS OF DUKE POWER COMPANY'S APPLICATION FOR A CONSTRUCTION

PERMIT FOR ITS PROPOSED OCONEE NUCLEAR STATION UNITS 1 AND 2

Note by the Director, Division of Reactor Licensing

The attached report has been prepared by the Division of Reactor Licensing for consideration by the Advisory Committee on Reactor Safeguards at its February 1967 meeting.

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The Duke Power Company has submitted an application dated December 2, 1966, for a construction permit and operating license for its Oconee Nuclear Station Units 1 and 2 to be located on the shore of the future Lake Keowee in Oconee County, South Carolina. The site will have an exclusion radius of 1 mile and 3 residences are located on the site. The nearest population center, Anderson, South Carolina (population 41,000), is about 21 miles southeast of the site.

Cooling water for the units will be provided from Lake Keowee. Earthen dams to form this lake are under construction. The foundation for the containment structure will be bedrock. The site grade will be about four feet below the level of the lake, but the land to the south and west slopes sharply away from the site.

The pressurized water reactor and steam system supplied by Babcock and Wilcox will be designed for an initial core thermal power level of 2452 MW thermal (839 MWe) and an ultimate core thermal output of 2568 MW thermal. The reactor nuclear design parameters present no extreme departures from recent designs proposed for the Turkey Point or Indian Point No. 2 reactors. As in these reactors, a positive moderator temperature coefficient is predicted, but space is provided for the insertion of fixed poison shims to reduce this coefficient if this is found necessary. A new statistical heat transfer analysis is used based on the BAW-168 correlation.

The control rod drive is a rack and pinion type which utilizes a nutating disk actuator to drive the pinion. The nutating drives are magnetically operated and hermetically sealed. The drives are being developed by the Diamond Power Specialty Corporation.

A unique feature of the steam system is the use of two once-through steam generators that will produce steam having approximately 35 degrees of superheat. The primary coolant enters the top of each steam generator through a single hot leg and returns to the reactor via two cold legs.

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The proposed prestressed containments are similar to the Turkey Point and Palisades containments. No iodine removal equipment is provided in the containment although a controlled leakage penetration room external to the containment has provision for iodine filtration.

A number of engineered safety features are shared between Units 1 and 2 in the proposed design. In addition, it appears that the active components of many of these engineered safety features will be in use during normal operation. We understand that the low pressure injection systems as shown in the report will be modified to include core flooding tanks (accumulators).

Emergency power for the plant will be provided from two 80 MWe hydro peaking plants located adjacent to the units. Steam-driven pumps are provided for decay heat removal, and shutdown cooling capability can be extended under blackout conditions by gravity flow from the lake through the condenser cooling water system.

Based on a preliminary review of the application, there appear to be no safety problems which cannot be resolved.

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