ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

April 16, 1970

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON H. B. ROBINSON UNIT NO. 2

Dear Dr. Seaborg:

During its 120th meeting, April 9-11, 1970, the Advisory Committee on Reactor Safeguards completed its review of the application by the Carolina Power and Light Company for a license to operate the H. B. Robinson Unit No. 2 at power levels up to 2200 MWt. During this review the project was considered at Subcommittee meetings held on January 21, 1970 at the plant site and on March 26, 1970 in Washington, D. C. In the course of these meetings, the Committee had the benefit of discussion with representatives and consultants of the Carolina Power and Light Company, Westinghouse Electric Corporation, Ebasco Services Incorporated, and the AEC Regulatory Staff. The Committee also had the benefit of the documents listed. The Committee reported to you on the construction of this plant in its letter dated February 17, 1967.

The H. B. Robinson site is in northeastern South Carolina about 56 miles from Columbia, South Carolina and consists of more than 5,000 acres including Lake Robinson. The minimum exclusion radius is 1400 feet and the nearest population center with more than 25,000 residents is Florence, South Carolina, approximately 25 miles to the southeast.

The nuclear steam supply system for the H. B. Robinson Unit No. 2 is the first of the three-loop Westinghouse line to be reviewed for operation. The design features are similar to those of the Ginna plant, previously discussed in the Committee's report to you dated May 15, 1969.

The applicant is reviewing his seismic design calculations. The results of this analysis and any corrective actions required should be reviewed by the Regulatory Staff prior to operation above 5 MWt.

Further study is required of the bases and means whereby decisions concerning reactor operation will be made in the event of an earthquake in the region of the site. This matter should be resolved in a manner satisfactory to the Regulatory Staff.

The applicant proposes to operate Robinson Unit No. 1 (coal-fired), and Robinson Unit No. 2 (nuclear) from one control room with a crew of five, consisting of a foreman (licensed senior operator), a licensed operator at the nuclear unit console, an unlicensed operator at the coal-fired unit console, and two auxiliary operators, one (licensed) responsible for the nuclear unit and the other for the coal-fired unit. It is the opinion of the Committee that the crew size proposed by the applicant for the nuclear unit is insufficient for safety during initial operation but might be found sufficient after an adequate period of satisfactory operation and a careful assessment of the crew size required for emergencies.

The applicant is using a partial loading of helium "pre-pressurized" fuel rods. The Committee believes that some surveillance of the Robinson fuel at high burnup is appropriate, with regard to assuring the ability of fuel elements to maintain their integrity while undergoing anticipated operational transients near the end-of-life.

The applicant plans to conduct containment proof testing and leak rate testing, prior to initial operation. Subsequently, he proposes leak rate testing only of each seam and penetration of the containment. The Committee believes that periodic integrated leak rate tests should be performed until the Regulatory Staff is satisfied that the methods provided by the applicant assure the required leak tightness of the containment. The Committee recommends that further study be made of possible means to assure the continued structural integrity of the containment throughout the life of the reactor.

The applicant is currently studying the consequences of plant operation with less than three loops in service. Until it can be shown that no design limits are exceeded or that trip points will be reliably reset by automatic action, power operation with less than three loops in service should be prohibited.

The applicant stated that he would provide a second completely independent turbine speed control system designed to meet nuclear protection system criteria of redundancy, separation, and reliability to reduce the probability of an overspeed condition. In addition, protection is to be provided in appropriate areas against damage in the unlikely event of large missiles arising from failure of the turbine rotor or discs. This matter should be resolved in a manner satisfactory to the Regulatory Staff prior to or early in the operation of this plant.

As methods for continuous monitoring of boron concentration and a more definitive determination of gross failure of a fuel element are developed, consideration should be given to their implementation in this plant.

Studies by the applicant are underway on the following problems identified in previous reports of the Committee:

(a) A study of means of preventing common failure modes from negating scram action and of design features to make tolerable the consequence of failures to scram during anticipated transients.

(b) Review of development of systems to control the buildup of hydrogen in the containment and of instrumentation to monitor the course of events in the unlikely event of a loss-of-coolant accident.

As solutions to these problems develop and are evaluated by the Regulatory Staff, appropriate action should be proposed and taken by the applicant on a reasonable time scale. The proposed action should be reviewed by the ACRS.

Other problems relating to large water reactors which have been identified by the Regulatory Staff and the ACRS and cited in previous ACRS reports should be dealt with appropriately by the Regulatory Staff and the applicant as suitable approaches are developed.

The Advisory Committee on Reactor Safeguards believes that, if due regard is given to the items mentioned above, and subject to satisfactory completion of construction and pre-operational testing, there is reasonable assurance that the H. B. Robinson Unit No. 2 can be operated at power levels up to 2200 MWt without undue risk to the health and safety of the public.

Sincerely yours,

/s/

Joseph M. Hendrie
Chairman

References attached

References

1) Carolina Power & Light Company letter dated July 16, 1968 tsmtg Report on Incidence of Corrosion on Prestressing Steel Tendons
2) Carolina Power & Light Company letter dated December 8, 1969 tsmtg Containment Design Report
3) Carolina Power & Light Company letter dated February 18, 1970 - Responding to Fish and Wildlife Service comments on Proposed Environmental Monitoring Program
4) Carolina Power & Light Company letter dated April 6, 1970 - Identifying the Program to develop and document the additional seismic analysis for Class I equipment and piping
5) Amendment No. 8 to License Application (Final Safety Analysis Report-Volumes 1, 2 and 3) dated November 20, 1968
6) Amendment No. 9 to License Application (designated FSAR Amendment No. 1) dated September 4, 1969
7) Amendment No. 10 to License Application (designated FSAR Amendment No. 2) dated October 27, 1969
8) Amendment No. 11 to License Application (designated FSAR Amendment No. 3) dated December 2, 1969
9) Amendment No. 12 to License Application (designated FSAR Amendment No. 4) dated December 15, 1969
10) Amendment No. 13 to License Application (designated FSAR Amendment No. 5) dated December 15, 1969
11) Amendment No. 14 to License Application (designated FSAR Amendment No. 6) dated January 23, 1970
12) Amendment No. 15 to License Application (designated FSAR Amendment No. 7) dated February 6, 1970
13) Amendment No. 17 to License Application (designated FSAR Amendment No. 8) dated February 24, 1970
14) Amendment No. 18 to License Application (designated FSAR Amendment No. 9) dated February 27, 1970
15) Amendment No. 19 to License Application (designated FSAR Amendment No. 10) dated March 18, 1970
16) Amendment No. 20 to License Application (designated FSAR Amendment No. 11) March 24, 1970