ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON 25, D. C.

July 5, 1962

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington 25, D. C.

Subject: REPORT ON CAROLINAS VIRGINIA TUBE REACTOR - CVTR

Dear Dr. Seaborg:

The Advisory Committee on Reactor Safeguards has been requested to review the safety of a power reactor being built at Parr, South Carolina. The Carolinas Virginia Nuclear Power Associates have applied to the Atomic Energy Commission for a license to operate this reactor at a thermal power level up to 44.3 megawatts. The Committee has had the benefit of the documents referenced below, full Committee meetings on May 10-11 and June 28-30, 1962, and a subcommittee meeting at the site on May 1, 1962.

The reactor is of unusual design principally because it incorporates heavy water, as both coolant and moderator, and U-shaped zircaloy-4 pressure tubes. The applicant has indicated that degradation of $D_2O$ by $H_2O$ will result in a gradual transition of the negative temperature and void coefficients of reactivity in a positive direction. This does not appear to be a safety problem, since the applicant has stated that no $H_2O$ supplies will be accessible to the $D_2O$ systems except in the heat exchanger, since the system should be unusually leak tight and operated always at a higher pressure than the secondary $H_2O$ system, and since the applicant has stated that he will replace the $D_2O$ when it becomes 2% degraded.

The applicant intends to utilize some control rods whose absorber sections are composed principally of boron stainless steel. A group of these rods will be subjected to a relatively high integrated neutron flux. The applicant has submitted evidence indicating that the predicted radiation damage should not significantly affect this material. This information, coupled with the applicant's stated intent to examine these rods periodically and well before any problems could develop, causes the Committee to believe that use of this material will not result in any significant hazard.

The applicant has presented extensive information on the expected performance of zircaloy-4 under the proposed conditions. The Committee believes that no safety problem should arise from the use of this material.

The planned procedures for the dry loading of the core and subsequent introduction of $D_2O$ do not appear to create a hazard.

It is the opinion of the Advisory Committee on Reactor Safeguards that this reactor can be operated as proposed without undue hazard to the health and safety of the public.

Sincerely yours,

/s/

F. A. Gifford, Jr.
Chairman

References:

1. Amendment No. 8, dtd 1/24/62, to CVNPA License Application, submitting Volume I-III, Final Hazards Summary Report.
2. Amendment No. 9, dtd 2/6/62, to CVNPA License Application, submitting Final Hazards Summary Report, Volume IV.
3. Amendment No. 10, dtd 2/19/62, to CVNPA License Application, submitting Appendix A, Technical Specifications to the Facility Operating License.
4. Amendment No. 11, dtd 4/24/62, to CVNPA License Application, submitting corrections to Vols. I-IV of the Final Hazard Summary Report.
5. Amendment No. 12, dtd 6/8/62, to CVNPA License Application, submitting Final Hazards Summary Report, Addendum No. 1.