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

January 13, 1966

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

Subject: REPORT ON CAROLINAS VIRGINIA TUBE REACTOR (CVTR) - CHANGE REQUEST NO. 9

Dear Dr. Seaborg:

At its sixty-ninth meeting, January 6-8, 1966, the Advisory Committee on Reactor Safeguards considered the request by the Carolinas Virginia Nuclear Power Associates (CVNPA) for Change Number Nine to Appendix A of License No. DPR-8. The proposed change would modify the CVTR technical specifications to permit the use of four special test fuel assemblies. The Committee had the benefit of a discussion with representatives of CVNPA, the Westinghouse Electric Corporation, and the AEC Regulatory Staff, and of the documents listed below.

Representatives of CVNPA have stated that in each of these special test fuel assemblies the inner ring of six positions will be utilized for special test fuel elements (or pins) while the outer ring of twelve positions will be filled with Al_2O_3 inert elements. These inert elements will help to assure that the pressure tube would not be damaged in event some of the inner six test elements should fail.

The fuel tested will include elements with various clads of Zircaloy and stainless steel and with two enrichments calculated to develop specific powers of 25.1 and 20.9 Kw/ft. Representatives of Westinghouse stated that no experimental measurements verifying the correctness of these configurations and enrichments had been made, although the calculations used were carried out by methods checked and adjusted earlier against similar experimental configurations of lower enrichment. The Committee believes that there is some chance that the desired power densities may be exceeded significantly unless special care is taken in locating these test assemblies within the core. The Committee suggests that, since several relocations of the test assemblies are planned, the initial location be planned in a conservative manner and that the initial operations be well monitored.

CVNPA stated that it was planned, during the first refueling in the spring of 1966, to insert the four test assemblies in the down-flow side of four new Zircaloy U-tubes. During the same refueling, an irradiated U-tube will be removed and destructively tested. The Committee believes that, because the test assemblies will be in new tubes and because test results will be available on an irradiated tube within a few months after the insertion, hydrogen embrittlement will not be an immediate problem in the new tubes. However, because of the importance of the problem to the overall safety of the reactor, the Committee urges that CVNPA pursue a vigorous surveillance program to check for hydrogen embrittlement. The Committee recommends that CVNPA inform the Staff of the Division of Reactor Licensing concerning the results of the tests on the irradiated U-tube and submit for Regulatory Staff approval their plans for a surveillance program.

In view of the small number of test fuel elements involved, and the low probability of U-tube failure, the ACRS believes that these assemblies can be run in the CVTR as proposed without undue hazard to the health and safety of the public.

Sincerely yours,

/s/ David Okrent

David Okrent
Chairman

References:
1. Change Request No. 9, dated October 29, 1965.
2. "Experiments with High Power Rating Fuel Rods", dated December 10, 1965.