UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

December 13, 1977

Honorable Joseph M. Hendrie
Chairman
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: REPORT ON DONALD C. COOK NUCLEAR PLANT UNIT NO. 2

Dear Dr. Hendrie:

During its 212th meeting, December 8-10, 1977, the Advisory Committee on Reactor Safeguards completed its review of the application of the Indiana and Michigan Electric Company and the Indiana and Michigan Power Company (the Applicants) for a permit to operate the Donald C. Cook Nuclear Plant Unit No. 2. The application was reviewed at a Subcommittee meeting in St. Joseph, Michigan on December 3, 1977, and a tour of the facility was made by Subcommittee members on December 2, 1977. During its review, the Committee had the benefit of discussions with representatives and consultants of the Nuclear Regulatory Commission (NRC) Staff, Westinghouse Electric Corporation, American Electric Power Service Corporation, and the Applicants. The Committee also had the benefit of the documents listed.

The Donald C. Cook Nuclear Plant is a two-unit station located on the eastern shore of Lake Michigan about 11 miles south-southwest of Benton Harbor, Michigan. The two units are virtually identical except that D. C. Cook Unit 1 utilizes 15 x 15 fuel assemblies and is licensed to operate at 3250 MWt while it is proposed that D. C. Cook Unit 2 will utilize 17 x 17 fuel assemblies and operate at 3391 MWt. Each unit includes a Westinghouse Electric Corporation pressurized water reactor and ice condenser containment structure. The Committee reported on the application for an operating license on D. C. Cook Unit 1 in its letters of October 17, 1973, March 11, 1976, and January 14, 1977 and for a construction permit on both units in its letter of December 13, 1968.

A surveillance program has been developed by the NRC Staff to follow the behavior of the 17 x 17 fuel assemblies and data are being obtained from several plants now in operation using 17 x 17 fuel assemblies. Experience to date has been good. The Committee was informed that the first full core inspection of the 17 x 17 fuel assemblies is scheduled for mid-1978 for the Trojan Nuclear Power Plant. The Committee wishes to be kept informed of the results of the various 17 x 17 fuel assembly inspections and test programs planned for the future.

The Applicants have requested two significant changes in the reactor core thermal hydraulic performance analysis for D. C. Cook Unit 2 which have not been requested for previously reviewed plants. These changes include the WRB-1 critical heat flux correlation and the Westinghouse Electric Corporation improved thermal design procedures. The NRC Staff has not yet completed its review. The Committee wishes to be kept informed and suggests that it should review these matters on a generic basis prior to any use of the new procedures.

The NRC Staff has identified a number of safety items which will require resolution before full power operation of D. C. Cook Unit 2. These matters should be resolved in a manner satisfactory to the NRC Staff.

The Applicants have made a number of design changes to D. C. Cook Unit 2 as a result of operating experience gained in D. C. Cook Unit 1. This experience, especially operation of the D. C. Cook Unit 1 ice condenser containment system over the last three-year period, has been helpful in the ice inventory maintenance of the D. C. Cook Unit 2 ice condenser. The Applicants and the NRC Staff should continue to monitor the ice condenser containments in both units to further enhance the safe operation of plants using this new concept.

The ACRS recommends that a report be made to the Committee after one year of operation at power which treats the following subjects:

a) A substantial data base obtained with D. C. Cook Unit 2 to verify the validity of out-of-core and incore measurements with the axial power distribution monitoring system (APDMS).

b) An evaluation of the emergency core cooling systems and shutdown heat removal systems to determine the possibility of improvements in reliability for D. C. Cook Unit 2.

With regard to the generic problems listed in the Committee's report, "Status of Generic Items Relating to Light-Water Reactors - Report No. 6," dated November 15, 1977, items considered relevant to Donald C. Cook Nuclear Plant are: II-2, 3, 4, 5B, 6, 7, 10; IIA-1, 2, 3, 4; IIB-2; IIC-1, 3A, 3B, 4, 5, 6; IID-2. These problems should be dealt with by the NRC Staff and Applicants as solutions are found.

The Advisory Committee on Reactor Safeguards believes that, if due consideration is given to the items mentioned above, and subject to satisfactory completion of construction and preoperational testing, there is reasonable assurance that the Donald C. Cook Nuclear Plant Unit No. 2 can be operated at power levels up to 3391 MWt without undue risk to the health and safety of the public.

Sincerely yours,

M. Bender
Chairman

References:

1. U. S. Nuclear Regulatory Commission: "Report to the Advisory Committee on Reactor Safeguards," in the matter of Indiana and Michigan Electric Company and Indiana and Michigan Power Company (I&MP Co.) application for an operating license for the Donald C. Cook Nuclear Plant Unit No. 2, Docket No. 50-316, dated November, 1977.
2. Indiana and Michigan Power Company: "Donald C. Cook Nuclear Plant Final Safety Analysis Report" with Amendments 1-79.
3. Letters from M. H. Judkis, Manager of American Electric Power Project for Westinghouse Electric Corporation, to Edson Case, Acting Director of the Office of Nuclear Reactor Regulation (ONRR), concerning resolution of outstanding issues, dated November 21, 1977 and November 18, 1977.
4. Letters from J. Tillinghast, Vice President of Indiana and Michigan Power Company (V.P. of I&MP Co.), to Edson Case, Acting Director, ONRR, concerning the Overpressurization Mitigating System, dated November 18, 1977 and August 4, 1977.
5. Letter from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning qualification of containment electrical penetrations for accident environments, dated November 17, 1977.
6. Letter from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning qualification tests of ice condenser components, dated October 27, 1977.
7. Letters from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning an analysis of a fuel handling accident inside containment, dated September 30, 1977 and June 17, 1977.
8. Letters from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning proposed technical specifications, dated September 22, 1977 and June 17, 1977.

9. Letter from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning the Quality Assurance Program for Operations, dated September 9, 1977.
10. Letter from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning design of the emergency power systems, dated July 22, 1977.
11. Letter from J. Tillinghast, V.P. of I&MP Co., to Edson Case, Acting Director, ONRR, concerning the design and procedures for operation of the local shutdown panels, dated June 1, 1977.
12. Letter from G. P. Malone, V.P. of I&MP Co., to B. Rusche, Director, ONRR, concerning fire hazards analysis, dated March 31, 1977.