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

October 12, 1966

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

Subject: REPORT ON PEACH BOTTOM ATOMIC POWER STATION

Dear Dr. Seaborg:

At its seventy-eighth meeting on October 6-8, 1966, the Advisory Committee on Reactor Safeguards considered the proposal of the Philadelphia Electric Company to operate the Peach Bottom Atomic Power Station at power levels up to 115 MW(t). The Committee had the benefit of discussion with representatives of the Philadelphia Electric Company, Bechtel Corporation, the General Atomic Division of General Dynamics Corporation, and the AEC Staff, and of the documents listed. A Subcommittee of the ACRS met at the plant site on September 23, 1966.

Proposed operation and testing of this plant at power levels up to 1 MW(t) had been reviewed previously by the Committee in November 1964. Completion of the plant in preparation for operation and testing up to 1 MW(t) was delayed by a cable fire in the containment during construction; the fire damage has been repaired and steps taken to reduce the possibility of recurrence.

The applicant reported that the planned program of tests at power levels up to 1 MW(t) was completed in May 1966 and that the measured nuclear characteristics of the reactor were in reasonable agreement with predicted values. Pre-operational shakedown tests of other components, however, disclosed leaks in the superheater section of the steam generators and some problems with the control rod drive mechanisms and the fuel transfer machine.

The leaks in the steam generators were reported to have been caused by stress corrosion cracking in the stainless steel superheater tubes, the superheater outlet piping, and the expansion bellows in the domes of the generators. These components were removed from each of the generators and are being replaced with Inconel and Incoloy components to reduce the possibility of recurrence of stress corrosion cracking. The expansion bellows is being replaced by an expansion loop. Testing after repairs are completed is to be performed in accordance with the requirements of

ASME Code Section VIII and will include radiographing of welds, helium mass spectrometer leakage testing of the tube-to-tubesheet welds and pneumatic pressure testing at 1.25 times design pressure.

Four of the control rod drive mechanisms exhibited erratic sticking in the regulating mode. The problem was traced to fractured balls in one of the three races of the ball nut assemblies of the linear actuators of these rods. It was reported, however, that these mechanisms were able to scram in every case despite the fractured balls. All drive mechanisms are being modified and tested to confirm operability.

The fuel transfer-machine performed well during early pre-operational testing, but gave problems with binding of the telescoping shaft during tests in hot helium. Modifications were made to eliminate interferences and the machine was used successfully in loading the core at room temperature. Subsequent to core loading, the machine was shipped to the General Atomic facilities for further modification and proof testing to confirm its operability in hot helium.

The Philadelphia Electric Company proposes a stepwise approach to power and has outlined a program of tests to be conducted during this period. The applicant proposes a detailed program of core surveillance and plant performance evaluation during the first year of power operation.

The Committee believes that the proposed testing during the ascent to full power and during subsequent operation can be conducted safely. After reaching full power, the applicant should develop, in co-operation with the AEC Staff, appropriate limits on reactivity and power anomalies. The Committee also believes that the applicant should develop and implement a program of periodic inspection of accessible primary system components during service life; this program should be developed in co-operation with the AEC Staff.

Some questions arose with regard to operating procedures involving the isolation valves and the prevention of negative pressure in the containment. These questions should be resolved in co-operation with the AEC Staff before the ascent to power.

The ACRS believes that, with satisfactory completion of the repair and testing of the steam generators and with successful completion of an adequate pre-operational testing program for the modified control rod drive mechanisms, the Peach Bottom reactor can be operated at power levels up to 115 MW(t) without undue risk to the health and safety of the public.

Dr. S. H. Bush did not participate in the Committee's review of this project.

Sincerely yours,

/s/
David Okrent
Chairman

References:

1. Philadelphia Electric Company letter dated November 3, 1964 to AEC Division of Reactor Licensing transmitting Amendment No. 8.

2. Sixth Semi-Annual Report, dated February 23, 1965.

3. Seventh Semi-Annual Report, dated August 23, 1965.

4. Final Semi-Annual Report, dated January 11, 1966.

5. Monthly Operations Report No. 1, March 1966.

6. "Steam Generator Superheater Section Repairs", dated April 1966.

7. Monthly Operations Report No. 2, April 1966.

8. Monthly Operations Report No. 3, May 1966.

9. Monthly Operations Report No. 4, June 1966.

10. Amendment No. 13 containing "Supplemental Technical Information for Operation at 115 MW(t)", transmitted by Philadelphia Electric Company letter dated August 18, 1966 to AEC Division of Reactor Licensing.

11. Monthly Operations Report No. 5, July 1966.

12. Philadelphia Electric Company letter dated September 22, 1966 to AEC Division of Reactor Licensing transmitting Amendment No. 14.