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

August 16,1966

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

Subject: REPORT ON DRESDEN NUCLEAR POWER STATION - UNIT 3

Dear Dr. Seaborg:

At its seventy-fourth meeting, on June 8-11, seventy-fifth meeting, on July 14-16, a special meeting on August 4-5, and its seventy-sixth meeting on August 11-13, 1966, the Advisory Committee on Reactor Safeguards reviewed the proposal of the Commonwealth Edison Company to construct a third nuclear power plant at the Dresden site, near Morris, Illinois. Unit 3 will include a boiling water reactor to be operated at 2255 MW(t) power level with pressure suppression containment. Unit 3 would be similar to Unit 2. The Committee had the benefit of discussions with representatives of the applicant, the General Electric Company, Sargent & Lundy, the Babcock & Wilcox Company, and the AEC Staff, and of the documents listed. A Subcommittee of the ACRS met to review this project at the Dresden site on June 2, 1966, and in Washington on July 7, 1966.

In its report on Dresden Unit 2, dated November 24, 1965, the Committee recommended that the AEC Staff follow development work by GE to resolve particular design problems. The Committee recommends that the Staff continue to follow the development work in connection with both Units 2 and 3, particularly with respect to operation with jet pumps, testing of emergency cooling methods, and studies of reactivity transients to assure no impairment of emergency cooling effectiveness as a consequence thereof.

The Committee also urged that the designers pay particular attention to the design of the pressure vessel, and of the high pressure steam lines with their isolation valves and fittings. The Committee reiterates its opinion on this matter in connection with Unit 3.

The Committee notes that the applicant has made improvements in the requirements for pressure vessel inspection during fabrication and urges that the applicant pursue vigorously the implementation of adequate in-service inspection techniques.

The effectiveness of emergency core cooling systems is a matter of particular importance in the unlikely event of a pipe rupture in the primary system. The applicant proposes the following improved complex of emergency cooling systems:

1. a high pressure coolant injection (HPCI) system,

2. a high-volume flooding system to permit rapid injection of water into the reactor vessel following blowdown to a low pressure,

3. two core spray systems,

4. a system that will make river water available to the feedwater pump for emergency cooling.

The applicant advised the Committee that equivalent changes in the emergency core cooling systems of the Dresden 2 unit would be made. Three diesel-driven generators will be installed to serve Units 2 and 3.

The Committee concurs that the proposed systems should increase the reliability and effectiveness of emergency core cooling. Complete details of the systems are not available, but the Committee believes that these matters can be resolved during construction of this facility. The Committee believes that the Regulatory Staff and the Committee should review details of design, fabrication procedures, plans for in-service inspection and the analyses pertaining to the emergency core cooling systems, as soon as this information is available and prior to irrevocable construction commitments pertaining thereto.

Careful examination of the forces during blowdown on various structural and functional members within the pressure vessel is necessary to assure sufficient conservatism in the design. The Committee recommends that the AEC Staff satisfy itself fully in this respect.

The Committee believes that the combination of emergency cooling systems has a high probability of guarding against core meltdown in the unlikely accident involving rupture of a primary system pipe. In view of the present state of development of such emergency cooling systems, however, and since the cooling systems may be subject to certain low-probability interrelated modes of failure, the Committee believes that the already small probability of primary system rupture should be still further reduced by taking additional measures as noted below. The Committee would like to review the results of studies by the applicant in this connection, and the consequent proposals, as soon as these are available.

1. Design and fabrication techniques for the entire primary system should be reviewed thoroughly to assure adequate conservatism throughout and to make full use of practical, existing inspection techniques which can provide still greater assurance of highest quality.

2. Great attention should be given to design for in-service inspection possibilities and the detection of incipient problems in the entire primary system during reactor operation. Methods of leak detection should be employed which provide a maximum of protection against serious incidents.

The Advisory Committee on Reactor Safeguards believes that the various items mentioned can be resolved during construction and that the proposed reactor can be constructed at the Dresden site with reasonable assurance that it can be operated without undue risk to the health and safety of the public.

Sincerely yours,

/s/

David Okrent
Chairman

References Attached.

References (Dresden 3)

1. Dresden Nuclear Power Station, Unit 3, Plant Design and Analysis Report, Volumes I and II, Commonwealth Edison Company, undated, received February 14, 1966.

2. Letter dated May 3, 1966 from L. F. Lischer, Commonwealth Edison, to Dr. R. L. Doan, AEC, transmitting Amendment No. 1, Answers to AEC Questions, including replacement and additional pages to Plant Design and Analysis Report.

3. Amendment No. 2, Answers to AEC Questions, undated, received May 20, 1966.

4. Letter dated May 26, 1966 from Murray Joslin, Commonwealth Edison, to Dr. R. L. Doan, AEC, transmitting Amendment No. 3, Answers to AEC Questions, including replacement pages to Plant Design and Analysis Report.

5. Supplement to Construction Permit Application, Reactor Vessel Non-Destructive Testing of Plate, dated June 10, 1966.

6. Letter dated July 8, 1966 from Murray Joslin, Commonwealth Edison, to Dr. R. L. Doan, AEC, with attachments.

7. Letter dated July 26, 1966 from F. A. Hollenbach, General Electric, to Mr. E. Case, AEC, with attachment.

8. Letter dated July 29, 1966 from Murray Joslin, Commonwealth Edison, to Mr. Edson Case, AEC.

9. Letter dated August 10, 1966 from W. D. Gilbert, General Electric, to Mr. E. Case, AEC, with attachment.

10. Letter dated August 12, 1966 from M. Joslin, Commonwealth Edison, to Dr. Richard L. Doan, AEC.