March 9, 1971

Honorable Glenn T. Seaborg
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON ENRICO FERMI ATOMIC POWER PLANT UNIT NO. 2

Dear Dr. Seaborg:

At its 131st meeting, March 4-6, 1971, the Advisory Committee on Reactor Safeguards completed its review of the application by the Detroit Edison Company for a permit to construct the Enrico Fermi Atomic Power Plant Unit No. 2. A Subcommittee met to review the project on November 23, 1970, at the site, again on December 8, 1970, and on February 24, 1971 in Washington, D. C. The applicant discussed the project with the Committee on December 11, 1970. During its review the Committee had the benefit of discussions with representatives and consultants of the applicant, the General Electric Company, English Electric - AEI Turbine Generator, Ltd., and the AEC Regulatory Staff. The Committee also had the benefit of the documents listed.

The Fermi Unit No. 2 will be located in Michigan on a 1088-acre site on the shore of Lake Erie, about 30 miles south of Detroit and a similar distance north of Toledo, Ohio. The site includes the fast reactor Unit No. 1, which is located about a quarter of a mile south of Unit 2. The nearest population center is Monroe, Michigan, about eight miles west-southwest, having a 1970 population of 24,000. The minimum distance from the reactor to the exclusion boundary is 3000 feet. The applicant has specified a radius of three miles for the low population zone, which will have an estimated population of 11,000 by 1980.

The Fermi Unit No. 2 will have an initial power of 3293 MWt. The applicant's analysis and our evaluation have, however, been based upon the ultimate power of 3428 MWt. Unit No. 2 is similar to the Browns Ferry units, and to the Shoreham and Hatch reactors, all previously reviewed. Waste heat from the plant will be rejected to the atmosphere by two natural draft towers each about 450 feet high. Cooled water from the towers will be piped to a 50-acre storage pond.

Cooling water for the main turbine condensers, and cooling water for residual heat removal, will both be obtained from the pond which will be constructed so that the bottom of the pond will be about 10.5 feet below normal lake level, but not below minimum lake level. The minimum water depth in the pond for operation of the reactor has been set at eight feet, which provides sufficient cooling water for shutdown heat removal for an extended period. The applicant's criteria for the construction of this pond are acceptable, but construction should not proceed until the Regulatory Staff has reviewed and approved the final design.

The applicant has presented preliminary analyses on the following three potential problems: recirculation pump-motor runaway during blowdown in the unlikely event of a loss-of-coolant accident; common mode failure of pressure relief valves; and potential for control rod guide tube collapse during a loss-of-coolant accident. Studies of these items are continuing and should be reviewed by the Regulatory Staff.

The turbine-generator for Fermi Unit No. 2 will be fabricated in the United Kingdom by English Electric - AEI Turbine Generator, Ltd. The fabrication procedures, quality assurance program, and control and protective instrumentation design have been reviewed with the applicant and English Electric - AEI Turbine Generator, Ltd. and are believed to be satisfactory.

The applicant is continuing to study further means of preventing common mode failures from negating reactor scram action, and of design features to make tolerable the consequences of failure to scram during anticipated transients. The Committee believes it desirable to expedite these studies and to implement in timely fashion such design modifications as are found to improve significantly the safety of the plant in this regard. The Committee wishes to be kept informed of the resolution of this matter.

The Committee has commented in previous reports on the development of systems to control the buildup of hydrogen in the containment that might follow in the unlikely event of a loss-of-coolant accident. The applicant proposes to use a purging technique after a suitable time delay subsequent to the accident. The Committee believes that purging capability should be retained, but that the primary protection in this regard should utilize a method of hydrogen control other than purging. The applicant should submit, on a reasonable time scale, a proposed design for hydrogen control, including provisions for inerting, for review by the Regulatory Staff. The Committee wishes to be kept informed of the resolution of this matter.

Additional studies are underway by the applicant and his contractors to provide further assurance that, with conservative assumptions, analyses of postulated loss-of-coolant accidents will not lead to peak clad temperatures which exceed the limits acceptable to the Regulatory Staff. The Committee believes that these studies should be expedited and the matter resolved in a timely fashion so that design modifications, if necessary, can be made with a minimum of difficulty. The Committee wishes to be kept informed.

The applicant stated that the biological shield surrounding the reactor vessel will be able to withstand the pressure and jet forces that could be developed by a failure in the region of a nozzle safe-end. The Regulatory Staff should follow the design to assure satisfactory resolution of the matter.

The Committee believes that the above items can be resolved during construction and that, if due consideration is given to these items, the Enrico Fermi Atomic Power Plant Unit No. 2 can be constructed with reasonable assurance that it can be operated at 3293 MWt without undue risk to the health and safety of the public.

Sincerely yours,

/s/ Spencer H. Bush

Spencer H. Bush
Chairman

<u>References - Enrico Fermi Atomic Power Plant Unit No. 2</u>

1) Detroit Edison Company License Application and Preliminary Safety Analysis Report (Volumes I through V), for Enrico Fermi Atomic Power Plant Unit No. 2

2) Amendments 1 through 17 to the Atomic Power Plant Unit No. 2 License Application for Enrico Fermi

3) Enrico Fermi Environmental Report, dated September 1970, The Detroit Edison Company