

UNITED STATES OF AMERICA  
ATOMIC ENERGY COMMISSION

In the matter of the application by )  
JERSEY CENTRAL POWER & LIGHT COMPANY )  
and )  
METROPOLITAN EDISON COMPANY )  
For a Provisional Construction Permit )  
(Three Mile Island Nuclear Station, )  
Unit 2) Middletown, Pennsylvania )

DOCKET NO. 50-320

Appearances

Gerald Charnoff, Esq.  
and  
Bruce W. Churchill, Esq.  
Appearing on behalf of the Applicants  
Jersey Central Power & Light Company  
and  
Metropolitan Edison Company

James P. Murray, Jr., Esq.  
Neil J. Newman, Esq.  
and  
Troy B. Conner, Jr., Esq.  
Appearing on behalf of the U. S. Atomic Energy Commission  
Regulatory Staff

INITIAL DECISION

Preliminary Statement

1. This proceeding involves the application of Jersey Central Power & Light Company and Metropolitan Edison Company (Applicants) for a provisional construction permit to construct a pressurized water reactor designed for initial operation at core power levels

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up to 2452 megawatts (thermal). The facility, designated as Three Mile Island Nuclear Station Unit 2, (hereinafter, Unit 2) will be located on the site at Three Mile Island adjacent to Unit 1, a nuclear electric generating plant which is now under construction by Metropolitan Edison Company. The island site in the Susquehanna River is in Dauphin County about 10 miles southeast of Harrisburg, Pennsylvania. The application has been reviewed by the Regulatory Staff (Staff) of the Atomic Energy Commission (Commission) and the Advisory Committee on Reactor Safeguards (ACRS), both of which concluded that there is reasonable assurance that the described facility can be constructed and operated at the proposed site without undue risk to the health and safety of the public.

2. In accordance with the requirements of the Atomic Energy Act and the Commission's regulations, and pursuant to the Notice of Hearing published in the Federal Register on August 27, 1969, at 34 FR 13708, a public hearing was held before this Atomic Safety and Licensing Board (Board) on October 6, 1969, in Middletown, Pennsylvania, to consider whether a provisional construction permit should be issued to the Applicants. The parties to the proceeding were the Applicants and the Staff. No petitions for leave to intervene were filed. Pursuant to Section 2.715(a) of the Commission's Rules of Practice, Dr. Arthur Socolow, an area resident who attended throughout the hearing, presented a limited appearance statement expressing concern relating to protection of the facility from aircraft using the nearby Olmsted State Airport. Mr. Thomas M.

Gerusky, representing the Pennsylvania Department of Health, stated that mutually satisfactory programs relating to radiological health and emergency procedures have been established in cooperation with the Applicants and the U. S. Public Health Service. Subsequent to the hearing proposed findings and conclusions were filed by the Applicants and the Staff.

3. This is not a contested proceeding as defined in Section 2.4(n) of the Commission's Rules of Practice. Accordingly, the Board is instructed by the Rules and in the Notice of Hearing to consider the issues of whether the application and the record of the proceeding contain sufficient information, and the review by the Staff has been adequate, to support the findings proposed to be made and the provisional construction permit proposed to be issued by the Director of Regulation. The findings and the permit proposed by the Director of Regulation were published in and with the Notice of Hearing. The post-hearing pleadings of the parties propose affirmative conclusions upon the issues; they are supported by and in accordance with the reliable, probative, and substantial evidence in the record.

Findings of Fact

4. Jersey Central Power & Light Company and Metropolitan Edison Company will share the financing and ownership of Unit 2 in the ratios of 25 percent and 75 percent, respectively. Each of the Applicants is an operating utility engaged in the generation, transmission and sale of electric power. The Applicants are two

of four wholly-owned subsidiaries of General Public Utilities Corporation (GPU), a Pennsylvania corporation registered under the Public Utility Holding Company Act of 1935. Each of the Applicants is financially sound and plans to finance its share of the costs of construction of the proposed facility as part of its overall construction program. Funds to meet construction requirements will be provided by internal sources and capital contributions from GPU and by the sale of debt securities in such a manner as to maintain a sound and conservative capital structure.

5. Metropolitan Edison Company is responsible for engineering, design, construction, operation and maintenance of Unit 2. Metropolitan Edison Company has 85 years' experience in the design, construction, and operation of electric generating stations, and is now constructing Three Mile Island Nuclear Station Unit 1. The GPU Nuclear Power Activities Group, with nuclear experience in operating power reactors at Saxton and Oyster Creek, will provide technical assistance and guidance to the Three Mile Island Project Director, John G. Miller, who is Vice President and Chief Engineer of Metropolitan Edison Company. The nuclear steam supply system is being designed and fabricated by the Babcock & Wilcox Company. Burns and Roe, Inc., has been engaged as the project architect-engineer except in the areas of cooling tower design and interfaces between Unit 1 and Unit 2 for which Gilbert Associates, Inc., has been engaged. United Engineers and Constructors, Inc., is the construction manager for both Unit 1 and Unit 2. Applicants

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will rely also on assistance in design, quality assurance, and structures to be provided by Pickard & Lowe Associates, MPR Associates, and Schupack & Associates. The record supports the Staff's conclusion that "the applicants are technically qualified to design and build the Three Mile Island Nuclear Station Unit 2".

6. The Unit 2 reactor will operate initially at core powers up to 2452 Mwt and is designed for an expected ultimate capacity of 2772 Mwt. This higher power has been used as the design basis for the containment and the engineered safety features, and it has been used by the Staff and the Applicants in the accident analyses and in the evaluation of all major structures, systems, and components which bear significantly on the acceptability of the site. The exclusion distance for the Three Mile Island site is 2,000 feet. Based upon the combined population of the Middletown-Steelton communities (22,450) with their nearest boundary at 2.2 miles, the Applicants have proposed a low population zone radius of two miles. The plant design will take into account local hydrological conditions, earthquakes, tornados, and possible aircraft impacts. The Applicants will provide protection against the Probable Maximum Flood (PMF) as calculated by the Corps of Engineers.

7. A comprehensive pre-operational environmental monitoring program has been in progress at this site for some time in connection with the Three Mile Island Unit 1. The Applicants will continue to cooperate with interested government agencies concerning

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radiological surveys and in accordance with recommendations of the Fish and Wildlife Service. This record includes evidence from the Applicants and Staff which indicates that the Susquehanna River basin as well as the Chesapeake Bay can accommodate the installation of the proposed plant and an additional number of other such plants without causing total or cumulative concentrations of radiological effluents to exceed more than a small fraction of the values set forth in 10 CFR Part 20.

8. The proposed facility incorporates numerous systems, components and features for the protection of plant personnel and the public and is similar in design to plants incorporating pressurized water reactors which have been previously approved for construction by the Commission. An important safety feature is the containment system which will completely enclose the reactor and major components of the primary coolant system. The containment system consists of a reinforced prestressed concrete structure with a vaportight steel liner. The prestressed tendons will be grouted to provide protection against corrosion. The containment structure is designed to accommodate, without loss of integrity, functional loads resulting from a loss-of-coolant accident occurring simultaneously with the maximum hypothetical earthquake and normal operating loads.

9. The proposed facility has two separable cooling systems which assure adequate core cooling and pressure reduction within the containment structure even if a loss-of-coolant accident should occur. For immediate short-term cooling, an emergency core cooling

system will inject cool borated water into each of the primary coolant loops and directly into the reactor vessel, thereby limiting the fuel pin clad temperatures and fission product release into the containment. For cooling containment air to reduce the containment vessel internal pressure in the unlikely event of a major accident, there are two independent spray systems which deliver cool borated water into the containment atmosphere. These systems will provide borated water containing dissolved sodium thiosulphate and sodium hydroxide to remove iodine in the event of an accident.

10. The Applicants and the Staff recognize that in order to develop the final design of the facility further information and data will be needed. Such additional information and data will be developed by research and development projects in the course of the final design work for the plant. In addition, basic work in progress is expected to provide some confirmation that the proposed designs are conservative. The major areas of research and development include the xenon oscillations, core thermal and hydraulic tests, fuel rod clad failure, high burnup fuel tests, internal vent valves, control rod drive test, once-through steam generator, in-core neutron detector test, blowdown forces on reactor internals, chemical spray system, and effects of radiolysis. The objectives of these programs have been defined, and a schedule for the furnishing of information prior to completion of construction of the proposed facility has been established.

11. Applicants have established a comprehensive quality assurance program which is consistent with the intent of, and which has been evaluated by the Staff in accordance with, the AEC's "Quality Assurance Criteria for Nuclear Power Plants" which was recently published as a proposed Appendix B to 10 CFR Part 50. Applicants' quality assurance organization, including the GPU Manager of Quality Assurance, will undertake to assure that the facility will be fabricated and constructed in accordance with applicable codes and specifications. The quality assurance program encompasses overall direction, guidance and surveillance over the quality assurance practices to be observed by the reactor supplier, the architect-engineer, the construction manager, and their subcontractors.

12. The facility will be located 2-1/2 miles from Olmsted State Airport. Although the probability of an aircraft incident at the Three Mile Island Nuclear Station is remote, the vital structures of the station will be designed to withstand a significant range of aircraft strike loadings, including such secondary effects as missiles, fire, pressure and temperature. Dr. Socolow's statement inquired about the capability of the containment building and other critical components to withstand an impact of a larger than the design basis aircraft (200,000 lbs.). The responsive evidence presented by the parties, in addition to that concerning the low probability of impact, is persuasive that there is little likelihood that any aircraft impact on the facility could cause the release of radioactivity. This view rests upon an evaluation of the conservative design of the



containment to withstand impact, and the value of the additional protection provided to the reactor and the primary cooling system by shield walls inside the containment. In addition, under adverse weather conditions involving poor visibility, landings by all large aircraft using Olmsted Airport would be under instrument flight regulations which then would not permit flights over the site.

13. The activities to be conducted under the provisional construction permit will be within the jurisdiction of the United States, and all of the directors and principal officers of the Applicants are United States citizens. The Applicants are not owned, controlled or dominated by an alien, a foreign corporation or a foreign government. The activities to be conducted do not involve any restricted data, but the Applicants have agreed to safeguard any such data which might become involved in accordance with 10 CFR Part 30.33(j). Special nuclear material for use as fuel in the proposed facility will be subject to Commission regulations and will be obtained from sources of supply such that there will be no diversion of such material to unauthorized uses.

#### Conclusions

14. Upon consideration of the entire record in this proceeding and the findings of fact and statements set forth above, the Board concludes that the application and the record of the proceeding contain sufficient information, and the review of the application by the Staff has been adequate to support the findings proposed to be made by the Director of Regulation, and the issuance of the provisional

construction permit as proposed by the Director of Regulation.

Order

Pursuant to the Act and the Commission's regulations, IT IS ORDERED that the Director of Regulation issue a provisional construction permit to the Jersey Central Power and Light Company and the Metropolitan Edison Company substantially in the form set forth in Appendix "A" to the Notice of Hearing in this proceeding.

IT IS FURTHER ORDERED, in accordance with 10 CFR Sections 2.760, 2.762 and 2.764 of the Commission's Rules of Practice, that this Initial Decision shall be effective immediately and shall constitute the final action of the Commission forty-five days after the date of issuance, subject to the review thereof and further decision of the Commission upon its own motion or upon exceptions filed pursuant to the cited rules.

ATOMIC SAFETY AND LICENSING BOARD

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J. D. Bond  
J. D. Bond, Chairman

Issued:  
October 31, 1969  
Germantown, Maryland

62-052

*A. Smith*

UNITED STATES OF AMERICA  
ATOMIC ENERGY COMMISSION



In the Matter of  
  
JERSEY CENTRAL POWER & LIGHT COMPANY  
and  
METROPOLITAN EDISON COMPANY  
  
(Three Mile Island Nuclear Station,  
Unit 2)

Docket No. 50-320

CERTIFICATE OF SERVICE

I hereby certify that copies of the INITIAL DECISION dated *Oct. 31, 1969*  
in the captioned matter have been served on the following by deposit in the  
United States mail, first class or air mail, this *31st* day of *Oct* 1969:

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