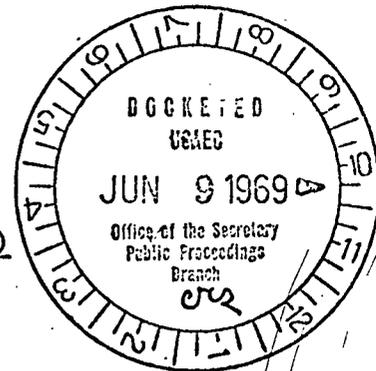


UNITED STATES OF AMERICA  
ATOMIC ENERGY COMMISSION

In the Matter of )  
 )  
CONSOLIDATED EDISON COMPANY OF )  
NEW YORK, INC. )  
 )  
(Indian Point Unit No. 3) )

Docket No. 50-286

AEC REGULATORY STAFF'S PROPOSED  
FINDINGS OF FACT AND CONCLUSIONS OF LAW  
(IN THE FORM OF A PROPOSED INITIAL DECISION)



PRELIMINARY STATEMENT

1. This proceeding involves the application of the Consolidated Edison Company of New York, Inc. (applicant) dated April 25, 1967, and twelve subsequent amendments (the application) properly filed under the provisions of Section 104b of the Atomic Energy Act of 1954, as amended (Act) for a provisional construction permit to construct a pressurized water reactor identified as Indian Point Unit No. 3, designed to operate initially at 3,025 megawatts (thermal), to be located at its Indian Point Site in the Town of Buchanan, Westchester County, New York.
2. 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 proposed facility can be constructed and operated at the proposed site without undue risk to the health and safety of the public. (Staff Safety Evaluation, Tr. 618 (S.E.)

63-66)

3. In accordance with the requirements of the Act and a notice of hearing published in the Federal Register on February 5, 1969, a public hearing was held before this atomic safety and licensing board (board) in Montrose, New York, on March 25-27, 1969, and in Cruegers, New York, April 28-May 2, and May 13-15, 1969, to consider whether a provisional construction permit should be issued to the applicant.

Parties and Appearances

4. This is a contested proceeding within the meaning of 10 CFR § 2.4(n) of the Commission's "Rules of Practice."

5. The parties to the proceeding are the applicant, the staff, and three intervenors -- the State of New York Atomic Energy Council (Council), the Citizens Committee for the Protection of the Environment (Committee), and Mary Hays Weik (Weik). At the prehearing conference held on March 11, 1969, pursuant to the notice of hearing, the three petitions for intervention were granted.

6. Essentially the Committee contended that (1) the Commission's regulations governing the releases of radioactive effluents to the environment as set forth in "Standards for Protection Against Radiation," 10 CFR Part 20, do not provide adequate protection to the public, (2) the Atomic Energy Commission should regulate the thermal effects of plant liquid effluent discharges on the Hudson River, and (3) before any construction permit should be issued the Commission must determine

that the potential risks of plant operation are outweighed by attendant benefits to the public. The Commission's regulations in Part 20, which are based upon the recommendations of the National Committee on Radiation Protection, the International Commission on Radiological Protection, the Federal Radiation Council, and other groups, establish permissible limits governing the discharge of radioactivity to the environment. The board has no authority, even if it were so disposed, to consider in this adjudicatory proceeding any modifications to the Commission's standards. Similarly, thermal effects from the Indian Point 3 plant may not be considered by this board in this proceeding. The Commission has consistently held that consideration of thermal effects in facility licensing proceedings is beyond its jurisdiction. This view has recently been upheld by the United States Court of Appeals for the First Circuit. (State of New Hampshire v. Atomic Energy Commission, 406 F.2d 170 (1st Cir. 1969))<sup>1/</sup> By the enactment of the Atomic Energy Act, national policy was established as to the benefit to the public from the peaceful uses of atomic energy. The Commission was empowered to determine specific criteria for the licensing of nuclear power plants. The Act and the Commission's regulations establish criteria concerning public health and safety and

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<sup>1/</sup> One witness for the Committee suggested that radiological effects on the environment might be affected by temperature increases. However, no definitive evidence was presented to support this suggestion (Tr. 1427-1439).

the common defense and security which must be met before a license may be issued pursuant to § 104b of the Act. However, these standards do not require an applicant to make any showing of benefit to the public to qualify for such a license. For these reasons the Committee's contentions are not relevant in the issues to this proceeding.

7. Other contentions raised by the Committee and by intervenor Weik at the hearing are considered in the following findings as to the safety of the plant.

8. Pursuant to section 2.715 of the Commission's "Rules of Practice," 22 persons and groups made limited appearances during the hearing, both favoring and opposing the project.

#### FINDINGS OF FACT

##### Financial and Technical Qualifications

9. The applicant is a public utility incorporated under the laws of the State of New York. The applicant has adequate financial resources at its command and anticipates that it will finance the construction of the plant from internally generated funds and the sale of securities.

(Applicant's Exhibit 1 (A.Ex. 1), 11-12; Tr. 622 (pp. 2-5))

10. The applicant is experienced in the construction and operation of nuclear powered generating stations as a result of its construction and operation of Indian Point Unit No. 1 and construction of Indian Point Unit No. 2. Westinghouse which is the prime contractor has had considerable experience in the design, development and construction of

reactor systems and components. United Engineers and Constructors, which has had broad experience in the nuclear field, has been retained by Westinghouse as Architect/Engineer. (S.E. 58; A.Ex. 1, 4, 7-11; Tr. 1509)

Site

11. The plant site is located in upper Westchester County, New York, approximately 24 miles north of New York City on the east bank of the Hudson River. The site covers approximately 235 acres and has a minimum exclusion distance of 0.22 miles. The nearest boundary of Peekskill, the population center, is 0.63 miles to the northwest; however, the nearest residential area of Peekskill is 0.85 miles to the east. (S.E. 4-5; A.Ex. 1, 13)

12. The plant design adequately takes into account hydrological conditions as well as the possibility of credible hurricanes, floods, and earthquakes. (S.E. 6-9; Staff Exhibit 1 (S.Ex. 1), question 35; A.Ex. 1, part III; Tr. 1017-1018)

13. The board inquired extensively into the applicant's plans to determine any effects of the release of radioactivity from the three Indian Point facilities on the environment. The applicant is conducting an environmental monitoring program which includes sampling of atmospheric dust; waters of the Hudson River, a small lake onsite, nearby reservoirs, and the onsite well; vegetation; atmospheric gross gamma activity; and marine life in the Hudson River. This

program has been in operation since 1958, and to date demonstrated that Indian Point No. 1 has had no adverse effect on the environment. We conclude that the applicant's program is adequate. (S.E. 9-10; Tr. 1954-1961; A.Ex. 1, 17)

14. The design of the plant's major systems and components which bear significantly on the acceptability of the facility at the proposed site under the site criteria guidelines identified in 10 CFR Part 100 of the Commission's regulations have been analyzed and evaluated by the applicant and the staff at a power level of 3,025 megawatts (thermal), the ultimate reactor power level expected for the reactor. (S.E. 65-66)

#### Plant

15. The nuclear steam supply system for Unit No. 3 is a four loop light water moderated pressurized water reactor. The basic design is like that of other Westinghouse reactors now under construction. The fuel for the reactor is low enrichment UO<sub>2</sub> pellets sealed within 12 feet long Zircaloy tubes. The reactor core contains 193 fuel assemblies (each containing 204 rods) which rest on the lower core plate. Reactivity is controlled by full and part length silver-indium-cadmium control rod assemblies, by fixed burnable poison rods, and by liquid boric acid poison in the coolant. (S.E. 11-17; A.Ex. 1, 18-22, 31 & 33)

16. Unit No. 3 will employ a steel-lined reinforced concrete containment similar to that used in Unit No. 2 and other facilities approved for construction. This containment, designed for 47 psig, will be tested for both structural integrity and leak-tightness prior to operation of the facility and will be capable of periodic testing over the life of the facility. Associated with the containment are a weld channel pressurization system and an isolation valve seal water system, which are intended to provide an essentially leak-tight containment system. (S.E. 11-17; S.Ex. 1, question 15; A.Ex. 1, 18-22; Tr. 1041-1043 (corrected page numbers))

17. Differences in design from Unit 3 and other similar reactors were thoroughly explored by the board and are not considered to be of safety significance. (S.E. 12)

18. The waste disposal systems for the plant were carefully reviewed by the board, particularly with respect to the possibility of exposure of the public to excessive quantities of radioactive material from liquid and gaseous discharges. The possibility of any release of liquid effluent entering potable water supplies, even including the City of New York's auxiliary water intake at Chelsea, 22 miles north of the site, was explored. The design of the plant provides capacity to hold up releases of wastes as necessary and to monitor releases to assure that excessive quantities of radioactivity are not discharged. The board believes that the design of the plant assures the protection of the public from exposure to radiation in excess of established

limits, and indeed establishes that discharges from the facility will be only a small fraction of these limits. (S.E. 23-24; A.Ex. 1, 15 & 42; A.Ex. 3, 15-1, 16-1; Tr. 822-846, 861-879, 1018-1020, 1027, 1919-1920, 1923-1926)

#### Engineered Safety Features

19. In addition to the containment system, other engineered safety features will be provided to minimize the consequences of the hypothetical "loss-of-coolant" accident. These include a safety injection system, air recirculation coolers and filters, containment spray equipment and the isolation valve seal water system. Reliable onsite diesel emergency power is provided for the engineered safety feature loads in the event of failure of normal station auxiliary power. (S.E. 30-33; A.Ex. 1, 36-38, 41, 44-46)

20. To eliminate the potential for rapid hydrogen oxidation, the applicant has proposed the use of a flame combustor to limit hydrogen concentration in the containment atmosphere below flammability limits, using the containment atmosphere as a primary oxidant and supplemental hydrogen as fuel. Two flame combustors will be located inside the containment, one serving as a spare. The operation of the units will be initiated prior to such time as hydrogen concentration reaches the flammability limit. On the basis of our review of the potential for hydrogen accumulation in the post-loss-of-coolant accident environment as a result of radiolytic decomposition and other hydrogen sources,

we conclude that there is reasonable assurance that the safety problems associated with the radiolytic production and recombination of hydrogen can be resolved prior to the operation of Unit No. 3 by the proposed research and development program. (S.E. 38-41; S.Ex. 1, question 11, 25; Tr. 977-979, 1016)

#### Safety Features

21. At the hearing the board carefully examined the capability of the engineered safety features to remove sufficient quantities of radioactive iodine to assure that Part 100 guidelines would not be exceeded under postulated accident conditions. In particular, the board was concerned with the amount of organic iodide which might be produced and the capability of the filter system to remove it. The board agrees with the staff that at present the evidence is conflicting regarding the capability of impregnated charcoal filters to efficiently remove organic iodides from a moving air stream in relative humidity of near 100%. For this reason a research and development study will be conducted. We agree with the staff that filter removal efficiency for organic iodides of at least 5% per pass can be achieved. However, in the event the research and development program to be conducted indicates that such minimal efficiencies cannot be obtained, the problem can be corrected by installing dehumidifier equipment or by initially isolating the filter beds to protect against high humidity or waterlogging. The board noted that in calculating the efficiency

of the engineered safety features to minimize the effects of postulated accidents, the estimated doses by the applicant and the staff were not the same. The staff believes that it should follow a generally more conservative model for meteorological and postulated accident conditions unless the applicant can demonstrate that its assumptions are correct. On the other hand, the applicant does not consider it necessary to take credit for plate-out of iodine under some accident conditions, because of its assumptions of more rapid removal of iodine by its spray and filter systems. This accounts for the variance in the calculated doses in postulated accident conditions. Under either the model used by the applicant or the more conservative one used by the staff, effects of postulated accidents are within the guidelines established by the Commission in 10 CFR Part 100. (S.E. 33-38, 43-45, 52-54; S.Ex. 1, question 3; A.Ex. 1, 44; Tr. 973-974, 1036-1037, 1360-1377, 1541-1553, 1693-1708, 1732-1740, 2050-2054, 2058-2067, 2118-2139, 2140-2167, 2194-2205)

#### Research and Development

22. The research and development programs which are planned or are underway pertain to core stability and power distribution monitoring, burnable poison rods, rod burst program containment spray, organic iodine removal by charcoal filters, failed fuel monitor, hydrogen generation, and other identified matters. These research and development programs apply to the operation of all pressurized water reactors

and have been underway for sometime, except in the case of the program for determining the efficiency of impregnated charcoal filters for removal of organic iodides under postulated post-accident conditions. After careful review, we conclude the programs are reasonably designed to accomplish their objectives, will provide adequate information on which to base analysis of the design and performance and should lead to acceptable designs for the respective systems. (S.E. 46-57; S.EX. 1, 4-5, 8, 10, 20-22; A.Ex. 1, Part VIII; Tr. 1016, 1322-1351, 1551-1565, 1595-1607, and see references cited in ¶ 21 above)

23. In the analysis of the thermal shock experienced by the vessel during safety injection following a loss-of-coolant accident, there are some uncertainties in the analytical method regarding properties of the steel after several years of neutron irradiation. These uncertainties are the subject of a research and development program. The results of the program will not be available until after Unit 3 begins operations. However, preliminary data indicate that the cumulative neutron irradiation of the vessel will not change its properties significantly prior to the time new information is available from the research and development program. Furthermore, provisions will be made in the design and layout of Unit No. 3 to enable installation of equipment to mitigate the consequences of a post-loss-of-coolant accident reactor vessel failure, if further analysis of the thermal shock experienced by the vessel during safety injection

indicates that no such protection should be required. We believe this research and development program provides reasonable assurance that the question will be satisfactorily resolved. (S.E. 30-33; S.Ex. 1, question 21; A.Ex. 1, 38-39; A. Ex. 3, question 13, 13-76 to 13-78)

Quality Assurance

24. The applicant has described a comprehensive quality assurance plan for the design and construction of Unit No. 3. Westinghouse Electric Corporation and its contractors will carry out a large portion of the quality assurance efforts on this project. Accordingly, the applicant requires them to maintain comprehensive quality assurance programs which are set forth in the plan. These programs provide for written procedures which are reviewed by the applicant. The applicant will further carry out its quality assurance responsibilities by monitoring the activities of Westinghouse and its contractors in critical areas through an independent detailed vendor surveillance program, a continuous onsite surveillance program, and a general review of engineering and safety analysis activities. In fulfilling these responsibilities the applicant will utilize the services of its own personnel; of its quality control and quality assurance surveillance agency, the U. S. Testing Company; and of its nuclear engineering consultant, the Southern Nuclear Engineering Company. (S.E. 59-61; S.Ex. 1, questions 29-32; A.Ex. 2; Tr. 1013-1016, 1495-1520)

Common Defense and Security

25. The application reflects that the activities to be conducted would be within the jurisdiction of the United States and that all of the directors and principal officers of the applicant are American citizens. We find nothing in the application to suggest that the applicant is 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 applicant has agreed to safeguard any such data which might become involved in accordance with paragraph 50.33(j) of 10 CFR 50. The applicant will rely upon obtaining fuel as it is needed from sources of supply available for civilian purposes, so that no diversion of special nuclear material from military purposes is involved. For these reasons, and in the absence of any information to the contrary, we conclude that the activities to be performed will not be inimical to the common defense and security. (S.E. 64)

CONCLUSION

26. The board has given careful consideration to all of the documentary and oral evidence produced by the parties and to the report of the Advisory Committee on Reactor Safeguards in this proceeding. The application and the proceeding thereon comply with the requirements of the Act and the Commission's regulations. There are no unresolved safety questions pertinent to the issuance of the provisional construction

permit. Based on our review of the entire record in this proceeding and the foregoing findings of fact and conclusions of law, we make affirmative findings on item numbers 1-3 and a negative finding on item 4 specified in the Notice of Hearing in this proceeding published in the Federal Register on February 5, 1969.

ORDER

27. Pursuant to the Act and the Commission's regulations, IT IS ORDERED that the Director of Regulation is authorized to issue the provisional construction permit to Consolidated Edison Company of New York, Inc., substantially in the form of Appendix "A" to the Notice of Hearing in this proceeding. IT IS FURTHER ORDERED, in accordance with sections 2.760, 2.762 and 2.764 of the Commission's "Rules of Practice," that this Initial Decision shall be effective immediately upon issuance and shall constitute the final decision 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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Samuel W. Jensch, Chairman

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Thomas H. Pigford

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John Henry Buck

Dated