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October 4, 1966

COPY NO. 55

ATOMIC ENERGY COMMISSION

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
(INDIAN POINT 2) DOCKET 50-247
INITIAL DECISION

Note by the Secretary

1. The attached initial decision issued by the Atomic Safety and Licensing Board is circulated for the information of the Commission.

2. The initial decision becomes effective on October 14, 1966 in the absence of any order by the Commission suspending effectiveness; the initial decision becomes the final decision of the Commission on November 18, 1966 unless there is a petition for review filed on or before October 24, 1966 or the Commission on its own motion directs the record be certified to it for final decision by November 18, 1966.

W. B. McCool

Secretary

DISTRIBUTION	COPY NO.	DISTRIBUTION	COPY NO.
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Dir. of Regulation	10-12	Naval Reactors	37-38
Deputy Dir. of Regulation	13	Operational Safety	39-40
Asst. Gen. Mgr.	14	Plans & Reports	41-42
Exec. Asst. to GM	15	Public Information	43-44
[illegible]	16	Reactor Dev. & Tech.	45-46

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10-4-66

UNITED STATES OF AMERICA

ATOMIC ENERGY COMMISSION

IN THE MATTER OF	)	
	)	
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.	)	DOCKET NO. 50-247
(Indian Point Station Unit No. 2)	)	

Appearances

Arvin E. Upton, Esq.
Eugene B. Thomas, Jr., Esq.
Lex K. Larson, Esq.
Appearing on behalf of the Applicant
Consolidated Edison Company of New York, Inc.

Troy B. Conner, Jr., Esq.
Ronald M. Weiskopf, Esq.
Appearing on behalf of the
Regulatory Staff of the
Atomic Energy Commission

Joseph F. Scinto, Esq.
Appearing on behalf of the
New York State Office of
Atomic and Space Development

Limited Appearances

Honorable Richard L. Ottinger
Congressman from New York
Frederick J. Martin, Jr.
Candidate for Congress from New York
James Stead
Executive Assistant to Westchester County Executives
William J. Burke
Mayor, Village of Buchanan
John R. Dunning
Chairman, Counsel on Science & Technology
for City of New York
Elizabeth R. Hogan
Pro Se
Walter S. Boardman
Pro Se
Smith W. Brookhart, Esq.
Counsel, National Parks Association
Mary Hays Weik
Secretary of Committee to End Radiological Hazards

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INITIAL DECISION

Consolidated Edison Company of New York, Inc. (Con-Ed), has filed an application and amendments thereto for licenses in accordance with Section 104b of the Atomic Energy Act, as amended, seeking, among other things, a construction permit to build a pressurized water reactor designed to operate at 2,758 MWt which is proposed to be located at Con-Ed's Indian Point site on the Hudson River in the Town of Buchanan, Westchester County, New York. The application, as amended, proposes that the facility will be constructed for Con-Ed in accordance with a contract executed with Westinghouse Electric Corporation and with the assistance of designated architect-engineers and a construction contractor. The contract provides that Westinghouse will complete the construction of the proposed facility and operate it for one hundred hours before delivery is considered complete to Con-Ed. The application contains a description of the site and the proposed facility, the financial qualifications of Con-Ed, as well as the technical qualifications of Con-Ed considered in combination with those of Westinghouse, to design and to construct the proposed facility.

Consistent with the requirements of Section 29 of the Atomic Energy Act, as amended, and the procedures of the Commission, the application and its five amendments have been reviewed by both

the Regulatory Staff of the Commission (Staff) and the Advisory Committee on Reactor Safeguards (ACRS).

The Atomic Energy Commission, in accordance with the requirements of the Act issued a notice providing for a hearing before an Atomic Safety and Licensing Board in the Town of Buchanan, New York.[1/] The State of New York, through its Office of Atomic and Space Development, intervened and participated in the proceeding. In addition there were several limited appearances, some of whom appeared in behalf of the project and others who appeared in opposition to the project. A petition to intervene in these proceedings was filed by The Conservation Center of New York on September 15, 1966, the second day of the evidentiary hearing. The petition was served upon

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1/ General public notice was given of the proceeding, which included publication in the Federal Register on July 30, 1966 (31 Fed. Reg. 10331). Prior to the convening of the hearing, public prehearing conferences were held in Buchanan on August 17, 1966, and on September 13, 1966, to consider procedural matters regarding the presentation of the evidence, schedules for witnesses and other items contemplated by the Rules of Practice of the Commission. At the aforesaid prehearing conference the date for the hearing was rescheduled for September 14, 1966, and due notice of this postponement was issued.

the parties and the Board during the second day of the hearings, and was denied by the Board.2/

2/ The formal petition to intervene alleged, among other items, the following:

> "The Conservation Center, Inc., a non-profit Delaware Corporation ... was organized in an effort to help protect the health, welfare and safety of the public in the Hudson River Valley Basin as well as in other areas of Eastern United States, where blight and pollution are present dangers.
>
> "The outcome of the present proceeding, and any increase in levels of radioactivity by the operation of the type of plant proposed manifestly affects the interests of the petitioner. The reasons supporting the petitioner's position in the proceeding are set forth in the pages hereinafter attached."

In the attached ten pages were quotations from several documents, particularly the Safety Evaluation by the Regulatory Staff of the Commission which expressed its belief that the construction and operation of the proposed facility would be without undue hazard to the health and safety of the public. Included in the petition, also, were several questions which have been substantially answered by the evidence presented.

The Board considered the petition to intervene at a recess in the hearings, as well as the arguments and presentations made after the recess, and denied the petition to intervene for failure to comply with the Rules of Practice of the Commission. The contentions of the participants had largely centered upon the requirement that a petition to intervene must set forth "... the interest of the petitioner in the proceeding, how that interest may be affected by Commission action, and the contentions of the petitioner."

Con-Ed's 250 acre site is on the east side of the Hudson River in the Town of Buchanan, Westchester County, New York. It is about 24 miles north of New York City and about 2.5 miles from the center of Peekskill. This second unit will be built adjacent to Con-Ed's existing nuclear generating station, known as Unit No. 1. There are approximately 53,000 people who live within 5 miles of the site; within a 10 mile radius there are about 155,000 people. In 1980 it is estimated that the population within this 10 mile radius will total about 325,000. As a consequence of its proximity to large population centers, specific engineered safeguards, which are considered later in this decision, have been designed to avoid undue exposure of the public to radiation in the event of an accident.

The area surrounding Indian Point is generally residential. Bedrock at the site will provide the foundation for the facility and its capacity for loads is calculated to be up to 50 tons per square foot, which exceeds any load that this plant will superimpose upon the bedrock. All ground water flow is toward the river and the site is not to be subject to flooding. The site is an area reported to be of relatively inactive seismic forces, and such as they are, more closely resemble the "creaking stair" releases from previous glacial weight, rather than tectonic or mountain

building forces such as those believed to be active on the west coast of the United States. The peak tidal flow of the Hudson past Indian Point is 80 million gallons per minute and thus there will be adequate mixing and dilution of any liquid discharges from the facility. Evaluations made of the meteorology at the site support the belief that atmospheric diffusion and distribution for the gases released from the facility can be expected.

Con-Ed is a large privately owned utility which supplies electric service to 2,900,000 customers in the city of New York and in most of Westchester County. It also supplies natural gas to about 1,300,000 customers and has facilities for providing 3,810,000 pounds of steam per hour which it sells to about 2,500 customers. Con-Ed's electric requirements are supplied by 12 generating stations which have a net generating capacity of approximately 7,477 megawatts. The maximum load is expected to increase to 7,750 megawatts in 1971. Con-Ed has exchange power arrangements with certain other utilities in New York State.

For several years Con-Ed has been actively engaged with several other companies in the nuclear development field. It also owns and operates a pressurized water reactor at Indian Point, which nuclear facility has operated successfully for more than four years.

Con-Ed has assets in excess of three billion dollars. It plans to finance the cost of construction of this proposed nuclear plant in the ordinary course of business through the internal generation of funds and the issuance of stocks and bonds.

The proposed pressurized water reactor facility is of the same general type as a number of others which are now in operation or under construction, including Connecticut Yankee at Haddam, Southern California Edison at San Onofre and the Rochester Gas and Electric facility at Brookwood. The reactor will be fueled with uranium dioxide sintered pellets, sealed in Zircaloy tubes. The actual core will be approximately 12 feet in diameter and 12 feet long. It will be confined in a pressurized vessel designed to withstand a pressure of approximately 2,500 psig. Cooling water will be circulated through the core and four steam generators by four 90,000 gpm primary coolant pumps.

The containment, within which the reactor vessel, steam generators, primary coolant pumps, and other primary system equipment will be located, will be a reinforced concrete structure similar in concept to the containment vessel being built for the Connecticut Yankee facility. The containment is designed to withstand the pressures and temperatures that would occur in the unlikely event of a failure of the largest primary coolant line and to retain radioactive fission products which might be released

as a consequence of this and lesser accidents. The Indian Point containment system is designed with the added objective of preventing outleakage under accident conditions. To achieve this goal, the containment system design includes a penetration pressurization system and an isolation valve seal water system. The penetration pressurization system will provide a zone maintained at a pressure of at least 50 psig at the potential leakage paths at the various containment penetrations. In addition, welded joints of the containment liner will also be covered with a channel which is pressurized to at least 50 psig. The value of 50 psig has been selected as being greater than the maximum pressure calculated to occur in the containment during the course of a major loss-of-coolant accident. The isolation valve seal water system will be designed to provide under accident conditions either a water seal at isolation valves or a water leg in fluid lines which penetrate the containment barrier. The water pressure at the valves or in the fluid line would be maintained at a pressure of at least 50 psig.

A safety injection system will be provided to cool the core with borated water in case of a major loss-of-coolant accident. In addition, two other emergency cooling systems (containment spray and air recirculation system) within the containment vessel will depressurize the containment by cooling the containment

atmosphere and will remove some radioactive fission products which might be released from the core as a consequence of an accident. Either of these containment cooling systems acting independently is designed to maintain internal containment pressure within acceptable limits with no reliance on the safety injection system. The systems will function in accordance with different principles and are to be provided with redundant components (pumps, valves, heat exchangers, etc.) within each system for maximum reliability. The service water system which will transfer the heat from the containment cooling systems to the river will also be provided with duplicate equipment so that no single failure would preclude continued operation of these important engineered safeguards.

While the design of Indian Point Unit No. 2 plant is similar in most respects to other pressurized water reactor facilities previously approved by the Commission, there are several differences. The length of the core in the Brookwood and Indian Point Unit No. 2 reactors will be 12 feet as compared to 10 feet in both Connecticut Yankee and San Onofre reactors. The Brookwood and Indian Point Unit No. 2 fuel rods will be clad with zirconium, whereas both San Onofre and Connecticut Yankee will employ stainless steel cladding in the first core. The Indian Point Unit No. 2 core will operate at somewhat higher linear heat generation rate (the maximum specific power in kilowatts per foot of a fuel rod is designed to be 18.5) and

higher central fuel temperature than Brookwood, San Onofre or Connecticut Yankee. Experience at these higher design values has been gained from fuel testing programs and operations in the Westinghouse Saxton reactor. Some of the post-accident reactor core and containment cooling system components will be installed inside the containment structure to minimize potential leakage sources, and a complete backup system will also be installed in the primary auxiliary building. The design capacity of the post-accident core cooling system has been improved by additional pumping capacity and piping. Most of these items are within the range of established technology and engineering practice. The others will be the subject of a development program proposed by Con-Ed. The development of the final design of the containment and the accident mitigating components will be carefully followed by the AEC Staff as recommended by the ACRS.

Although both the Staff and ACRS have concluded that there is reasonable assurance that the proposed facility can be constructed and operated without undue risk to the health and safety of the public, ACRS has enumerated several items which they wish to review before the issuance of an unqualified approval for a

construction permit. Specifically, their view[3] is, in part, as follows:

"The Indian Point 2 plant is provided with two safety injection systems for flooding the core with borated water in the event of a pipe rupture in the primary system. The emergency core cooling systems are of particular importance, and the ACRS believes that an increase in the flow capacity of these systems is needed; improvements of other characteristics such as pump discharge pressure may be appropriate. The forces imposed on various structural members within the pressure vessel during blowdown in a loss-of-coolant accident should be reviewed to assure adequate design conservatism. The Committee believes that these matters can be resolved during construction of these facilities. However, it believes that the AEC Regulatory Staff and the Committee should review the final design of the emergency core cooling systems and the pertinent structural members within the pressure vessel, prior to irrevocable commitments relative to construction of these items.[4]

* * * * *

"In order to reduce still further the low probability of primary system rupture, the applicant should take the additional measures noted below. The Committee would like to review the results of studies made by the applicant in this connection, and consequent proposals, as soon as these are available.[4]

"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.

3/ As Attachment "A", the complete ACRS letter is included.

4/ Emphasis added.

"2. Great attention should be placed in design on in-service inspection possibilities and the detection of incipient trouble in the entire primary system during reactor operation. Methods of leak detection should be employed which provide a maximum of protection against serious accidents.

* * * *

"The applicant has made studies of reactivity excursions resulting from the improbable event that structural failure leads to expulsion of a control rod from the core. Such transients should be limited by design and operation so that they cannot result in gross primary-system rupture or disruption of the core, which could impair the effectiveness of emergency core cooling. The reactivity transient problem is complicated by the existence of sizeable positive reactivity effects associated with voiding the borated coolant water, particularly early in core life. In addition the course of the transients is sensitive to various parameters, some of which remain to be fixed during the final design. Westinghouse representatives reported that the magnitude of such reactivity transients could be reduced by installation of solid burnable poisons in the core to permit reduction of the soluble boron content of the moderator, thereby reducing the positive moderator coefficient. The Committee agrees with the applicant's plans to be prepared to install the burnable poison if necessary. The Committee wishes to review the question of reactivity transients as soon as the core design is set" 5/

These requests by ACRS that further data, particularly in reference to emergency core cooling systems and pertinent structure members within the pressure vessel, be made available for its review "... prior to irrevocable commitments relative to construction of these items.", reflect a concern not heretofore expressed in ACRS reports. Records of unrelated proceedings in the public

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5/ Emphasis added.

files of the Commission show, however, that as a matter of practice, applicants for licenses to construct and operate nuclear facilities do keep the ACRS, as well as the Staff, informed respecting progress in design and technology for a facility even after the issuance of a construction permit. It is reasonable to conclude that the same informational procedures will remain in effect.

A review and a hearing at the construction permit stage of a nuclear facility project is a more limited one than is available when the consideration is related to a request for an operating authority. At the construction permit hearing, the principal architectural and engineering criteria are presented. In addition, Con Edison here, as have other applicants in most instances involving construction permits, has presented considerable design detail related to those criteria. Con Edison has also identified those technical features and components requiring further design work. The review by the Atomic Safety and Licensing Board is limited to a consideration of those criteria and technical design features which have been presented and which in the Board's opinion are adequate to provide reasonable assurance that the proposed facility can be constructed and operated without undue risk to the health and safety of the public. The Rules of the Commission permit the Board, upon making that finding, to authorize in its initial decision the issuance of a provisional construction

permit. The Rules of the Commission also contemplate that in the interim before an operating license is sought, the indicated architectural and engineering details will be developed and presented for Commission review, which could include hearings if deemed advisable.

It is apparent that the ACRS has concluded that the additional architectural and engineering details can be developed in a way that will provide reasonable assurance if this facility is later authorized to be operated, that it can be done without undue risk to the health and safety of the public.

At the present status of development of the architectural and engineering features, however, the ACRS recommendation to the Commission is that the ACRS desires to review final design details for the specified facility components. This will, of course, provide the best basis for a substantial determination respecting the safety of the project. The Commission's program of safety reviews indicates its desire to have available to it additional objective and independent technical reviews, first by the ACRS, and secondly, by the Atomic Safety and Licensing Boards, and thus it is concluded that there appears no doubt that the Commission will accede to this ACRS request.

For the decision which must be made at the construction permit stage by an Atomic Safety and Licensing Board, however,

we conclude in our review and determination respecting the architectural and engineering criteria and features which have been presented that there is reasonable assurance that the proposed facility can be constructed and operated without undue risk to the health and safety of the public.

At the conclusion of the hearing, Consolidated Edison filed with the Board, in accordance with Section 2.764(a) of the Commission's Rules of Practice, a motion for expedited effectiveness of the initial decision. There was no objection to the motion by the Staff or the State of New York.

Section 2.764(a) of the Commission's Rules of Practice provides as follows:

> "... An initial decision directing the issuance or amendment of a construction permit or construction authorization may, upon written motion, be made effective ten (10) days after issuance when the presiding officer finds that (1) no significant question of fact, law, or discretion has been presented; (2) that the record clearly warrants such action and shows that denial of the motion will result in substantial economic injury or be detrimental to the public interest."

It must be clear from the extensive record of this evidence and the consideration thereof as reflected in this initial decision that significant and substantial questions of fact have been presented.[6/] The record also shows that Con-Ed has an increasing

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6/ The Staff proposal respecting the motion is related to the language of Section 2.761 of the Rules and is rejected on that ground.

demand for electricity and means must be found to fulfill that demand. Con-Ed has presented evidence respecting the capacity of its existing generating plants and its endeavors to provide additional capacity, including the protracted Storm King Mountain pumped water storage project. A failure to supply the demand would affect the public interest that buyers have in their concern that electricity be delivered when they make a call for it. Con-Ed is obligated in the public service to make delivery as the demand arises and as it may vary from time to time. The Board, having found that reasonable assurance has been established that, based upon the present record the proposed facility can be constructed and operated within the limits of the principal architectural and engineering criteria without undue risk to the health and safety of the public, consideration can then be given to the possibility of substantial economic injury if the effective date of this initial decision is not advanced for the short period of time permitted by the Rules of Practice of the Commission. Con-Ed has asserted that as the fall and winter weather approaches, each day is important in the construction schedule in order to achieve as much cement work as possible before freezing weather delays the work. These aspects of construction are reflected in the capability of Con-Ed to supply the demands made upon it for electricity. The Board concludes that substantial

economic injury will occur if this initial decision is not made effective in accordance with the Rules, and thus the motion is granted and the order herein will so provide.

Upon a consideration of all of the evidence, the contentions and the proposed findings and conclusions submitted by the parties, which have been substantially adopted as herein shown, the Atomic Safety and Licensing Board finds and concludes as follows:

(1) Consolidated Edison Company of New York, Inc., has supplied sufficient information to warrant the issuance of a provisional construction permit. The absence of many details and features related to the general architectural and engineering criteria, which must necessarily await a research and development program, precludes the issuance of an unqualified construction permit at this time;

(2) Consolidated Edison Company has described the proposed design, including but not limited to the principal architectural and engineering criteria for the design, and has identified the major features or components on which further technical information is required and which is to be supplied;

(3) The omitted technical information will be supplied;

(4) Consolidated Edison has proposed, and there will be conducted, a research and development program reasonably

designed to resolve the safety questions with respect to those features or components which require research and development; and

(5) On the basis of the foregoing, there is reasonable assurance that (i) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility and (ii) taking into consideration the site criteria contained in Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public;

Consolidated Edison is technically qualified to design and construct the proposed facility;

Consolidated Edison is financially qualified to design and construct the proposed facility;

The issuance of a permit for the construction of the facility will not be inimical to the common defense and security or to the health and safety of the public.

WHEREFORE, in accordance with Section 104b of the Atomic Energy Act, as amended, and the Rules and Regulations of the Commission, IT IS ORDERED that, subject to review by the Commission upon its own motion or upon the filing of exceptions in accordance with the Rules of Practice, 10 CFR Part 2, Consolidated Edison is

authorized to construct the facility in accordance with the application and with the evidence and representations entered in the record at the hearing; and the Director of the Division of Reactor Licensing is directed to issue a provisional construction permit pursuant to Section 104b of the Act substantially in the form of Attachment "B" hereto.

IT IS FURTHER ORDERED THAT, in accordance with Section 2.754, this Initial Decision shall become effective on October 14, 1966, and, in the absence of any further order from the Commission, shall constitute the final decision of the Commission on November 18, 1966, subject to the filing of exceptions and to any order by the Commission upon such petition or upon its own motion.

ATOMIC SAFETY AND LICENSING BOARD

David B. Hall

John C. Geyer

Samuel W. Jensch, Chairman

Attachments:
Attachment "A"
Attachment "B"

Issued: October 3, 1966
Germantown, Maryland

ATTACHMENT "A"

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

UNITED STATES ATOMIC ENERGY COMMISSION
Washington, D. C. 20545

AUG 16 1966

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

Subject: REPORT ON INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

Dear Dr. Seaborg:

At its seventy-fifth meeting, July 14-16, 1966, and its special meeting on August 4-5, 1966, the Advisory Committee on Reactor Safeguards completed its review of the application of Consolidated Edison Company of New York, Inc. for authorization to construct Indian Point Nuclear Generating Unit No. 2. This project had previously been considered at the seventy-second and seventy-third meetings of the Committee, and at Subcommittee meetings on March 30, May 3, and June 23, 1966. During its review, the Committee had the benefit of discussions with representatives of the Consolidated Edison Company and their contractors and consultants and with representatives of the AEC Regulatory Staff and their consultants. The Committee also had the benefit of the documents listed.

The Indian Point 2 plant is to be a pressurized water reactor system utilizing a core fueled with slightly enriched uranium dioxide pellets contained in Zircaloy fuel rods; it is to be controlled by a combination of rod cluster-type control rods and boron dissolved in the primary coolant system. The plant is rated at 2758 MW(t); the gross electrical output is estimated to be 916 MW(e). Although the turbine has an additional calculated gross capacity of about 10%, the applicant has stated that there are no plans for power stretch in this plant.

The Indian Point 2 facility is the largest reactor that has been considered for licensing to date. Furthermore, it will be located in a region of relatively high population density. For these reasons, particular attention has been given to improving and supplementing the protective features previously provided in other plants of this type.

The proposed design has a reinforced concrete containment with an internal steel liner which is provided with facilities for pressurization of weld areas to reduce the possibility of leakage in these areas. The containment design also includes an internal recirculation

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containment spray system and an air recirculation system consisting of five air handling units to provide long-term cooling of the containment without having to pump radioactive liquids outside the containment in the event of an accident. Even though the applicant anticipates negligible leakage from the containment, two independent means of iodine removal within the containment have been provided. These are an air filtration system using activated charcoal filters, and a containment spray system which uses sodium thiosulfate in the spray water as a reagent to aid removal of elemental iodine.

The reactor vessel and various other components of the system are surrounded by concrete shielding which provides protection to the containment against missiles that might be generated if structural failure of such components were to occur during operation at pressure. This includes missile protection against the highly unlikely failure of the reactor vessel by longitudinal splitting or by various modes of circumferential cracking. The Committee favors such protection for large reactors in regions of relatively high population density.

The Indian Point 2 plant is provided with two safety injection systems for flooding the core with borated water in the event of a pipe rupture in the primary system. The emergency core cooling systems are of particular importance, and the ACRS believes that an increase in the flow capacity of these systems is needed; improvements of other characteristics such as pump discharge pressure may be appropriate. The forces imposed on various structural members within the pressure vessel during blowdown in a loss-of-coolant accident should be reviewed to assure adequate design conservatism. The Committee believes that these matters can be resolved during construction of these facilities. However, it believes that the AEC Regulatory Staff and the Committee should review the final design of the emergency core cooling systems and the pertinent structural members within the pressure vessel, prior to irrevocable commitments relative to construction of these items.

The applicant stated that, even if a significant fraction of the core were to melt during a loss-of-coolant accident, the melted portion would not penetrate the bottom of the reactor pressure vessel owing to contact of the vessel with water in the sump beneath it.

The applicant also proposes to install a backup to the emergency core cooling systems, in the form of a water-cooled refractory-lined stainless steel tank beneath the reactor pressure vessel. The Committee would like to be advised of design details and their theoretical and experimental bases when the design is completed.

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In order to reduce still further the low probability of primary system rupture, the applicant should take the additional measures noted below. The Committee would like to review the results of studies made by the applicant in this connection, and 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 placed in design on in-service inspection possibilities and the detection of incipient trouble in the entire primary system during reactor operation. Methods of leak detection should be employed which provide a maximum of protection against serious incidents.

Attention should also be given to quality control aspects, as well as stress analysis evaluation, of the containment and its liner. The Committee recommends that these items be resolved between the AEC Regulatory Staff and the applicant as adequate information is developed.

The applicant has made studies of reactivity excursions resulting from the improbable event that structural failure leads to expulsion of a control rod from the core. Such transients should be limited by design and operation so that they cannot result in gross primary-system rupture or disruption of the core, which could impair the effectiveness of emergency core cooling. The reactivity transient problem is complicated by the existence of sizeable positive reactivity effects associated with voiding the borated coolant water, particularly early in core life. In addition, the course of the transients is sensitive to various parameters, some of which remain to be fixed during the final design. Westinghouse representatives reported that the magnitude of such reactivity transients could be reduced by installation of solid burnable poisons in the core to permit reduction of the soluble boron content of the moderator, thereby reducing the positive moderator coefficient. The Committee agrees with the applicant's plans to be prepared to install the burnable poison if necessary. The Committee wishes to review the question of reactivity transients as soon as the core design is set.

COPY

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 Indian Point 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

David Okrent
Chairman

References:

1. Consolidated Edison Company of New York, Inc., Indian Point Nuclear Generating Unit No. 2, Preliminary Safety Analysis Report, Volume 1, and Volume 2, Parts A & B, received December 7, 1965.
2. First Supplement to Preliminary Safety Analysis Report, dated March 31, 1966.
3. Second Supplement to Preliminary Safety Analysis Report, received June 2, 1966.
4. Errata Sheets for Preliminary Safety Analysis Report and First Supplement thereto, received June 13, 1966.
5. Third Supplement to Preliminary Safety Analysis Report, received June 22, 1966.
6. Fourth Supplement to Preliminary Safety Analysis Report, received July 28, 1966.
7. Fifth Supplement to Preliminary Safety Analysis Report, received July 28, 1966.

ATTACHMENT "D"

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

DOCKET NO. 50-247

PROVISIONAL CONSTRUCTION PERMIT

Construction Permit No.

1. Pursuant to Section 104b of the Atomic Energy Act of 1954, as amended (the Act), and Title 10, Chapter 1, Code of Federal Regulations, Part 50, Licensing of Production and Utilization Facilities, and pursuant to the order of the Atomic Safety and Licensing Board, the Atomic Energy Commission (the Commission) hereby issues a provisional construction permit to Consolidated Edison Company of New York, Inc. (Consolidated Edison) for a utilization facility (being a part of an electric generating plant designated as Indian Point Station Unit No. 2) described in the application and amendments thereto filed in this matter by Consolidated Edison and as also described in the evidence received at the public hearing upon that application. The utilization facility is a pressurized water reactor having a thermal capacity of and designed to operate at 2758 megawatts. The plant of which the facility is a part will be located on the Hudson River in the Village of Buchanan, Westchester County, New York.

2. This permit shall be deemed to contain and is subject to the conditions specified in Sections 50.54 and 50.55 of said regulations; is subject to all applicable provisions of the Act, and rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the conditions specified or incorporated below:

   A. The earliest date for completion of the facility is January 1, 1969 and the latest date for completion of the facility is June 1, 1969.

   B. The facility shall be constructed and operated at the site as described in the application as amended in the Village of Buchanan, Westchester County, New York.

   C. This construction permit authorizes Consolidated Edison to construct the facility described in the application and the hearing record in accordance with the principal architectural and engineering criteria set forth therein.

3. This permit is provisional to the extent that a license authorizing operation of the facility will not be issued by the Commission unless: (A) Consolidated Edison submits to the Commission, by amendment to the application, the complete final hazards summary report, portions of which may be submitted and evaluated from time to time; (B) the Commission finds that the final design provides reasonable assurance that the health and safety of the public will not be endangered by the operation of the facility in accordance with procedures approved by it in connection with the issuance of said license; and (C) Consolidated Edison submits proof of financial protection and the execution of an indemnity agreement as required by Section 170 of the Act.

4. Pursuant to Section 50.60 of the regulations in Title 10, Chapter 1, CFR, Part 50, the Commission has allocated to Consolidated Edison for use in the operation of the reactor 23,222 kilograms of uranium 235 contained in uranium in the isotopic ratios specified in the application. Estimated schedules of special nuclear material transfers to Consolidated Edison and returns to the Commission are contained in Appendix A which is attached hereto. Transfers by the Commission to Consolidated Edison in accordance with the column entitled "AEC to Con Ed" in Appendix A will be conditioned upon Consolidated Edison's return to the Commission of material substantially in accordance with the column entitled "Con Ed to AEC" in Appendix A.

FOR THE ATOMIC ENERGY COMMISSION

Director
Division of Reactor Licensing

Attachment:
Appendix A

Date of Issuance:

ALLOCATION OF SPECIAL NUCLEAR MATERIALS TO CONSOLIDATED EDISON COMPANY INDIAN POINT #2 (KG U-235)

FY	AEC to Con Ed 1/	Con Ed to AEC		Year Net	Cumulative Net
		Cold 1/	Irrad. 4/		
1968	2,378 2/	-0-	-0-	2,378	2,378
1969	-0-	238 3/	-0-	(238)	2,140
1970	1,904	-0-	-0-	1,904	4,044
1971	952	190	295 5/	467	4,511
1972	952	95	206 6/	651	5,162
1973	952	95	197 7/	660	5,822
1974	952	95	252	605	6,427
1975	952	95	504	353	6,780
1976	952	95	252	605	7,385
1977	952	95	252	605	7,990
1978	952	95	252	605	8,595
1979	952	95	252	605	9,200
1980	952	95	252	605	9,805
1981	952	95	252	605	10,410
1982	952	95	252	605	11,015
1983	952	95	252	605	11,620
1984	952	95	252	605	12,225
1985	952	95	252	605	12,830
1986	952	95	252	605	13,435
1987	952	95	252	605	14,040
1988	952	95	252	605	14,645
1989	952	95	252	605	15,250
1990	952	95	252	605	15,855
1991	952	95	252	605	16,460
1992	952	95	252	605	17,065
1993	952	95	252	605	17,670
1994	952	95	252	605	18,275
1995	952	95	252	605	18,880
1996	952	95	252	605	19,485
1997	952	95	252	605	20,090
1998	952	95	252	605	20,695
1999	952	95	252	605	21,300
2000	952	95	252	605	21,905

(continued)

1/ 2.92% unless otherwise indicated.
2/ 727 kg at 2.23%; 776 kg at 2.38; 875 kg at 2.68.
3/ 73 kg at 2.23%; 77 kg at 2.38; 88 kg at 2.68.
4/ 0.92% unless otherwise indicated.
5/ 1.06%
6/ 0.75%
7/ 0.72%

Allocation of Special Nuclear Materials to
Consolidated Edison Company, Indian Point #2
(KG U-235)

Fy	AEC to Con Ed	Con Ed to AEC Cold	Con Ed to AEC Irrad.	Year Net	Cumulative Net
2001	952	95	252	605	22,510
2002	952	95	252	605	23,115
2003	952	95	252	605	23,720
2004	952	95	252	605	24,325
2005	-0-	95	252	(347)	23,978
2006	-0-	-0-	252	(252)	23,726
2007	-0-	-0-	252	(252)	23,474
2008	-0-	-0-	252	(252)	23,222
TOTAL	36,650	3,658	9,770	23,222	---