

The Conservation Center

866 UNITED NATIONS PLAZA NEW YORK, N. Y. 10017

September 8, 1966

Secretary  
United States Atomic Energy Commission  
Washington, D. C. 20545

Dear Sir:

The Conservation Center requests permission to intervene in the Matter of Consolidated Edison Company of New York, Inc. (Indian Point Station Unit No. 2), Docket No. 50-247. The Conservation Center, a non-profit corporation, is dedicated to the preservation of a good environment in the East, particularly New York City and the Hudson River Valley.

From a review of the Safety Evaluation by the Division of Reactor Licensing, we believe undue risks to public health, life and property are entailed should a license to build and operate this plant, as presently specified, be issued.

We have prepared a statement of objections to the Safety Evaluation, which we would like to have made a part of the record at the public hearing. In entering these objections, we wish to state that we are not opposed to experimental atomic energy plants where proper safeguards can be provided.

Sincerely yours,

*Larry Bogart*

Larry Bogart  
Director

APPENDIX "C"

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Convention Center 866 UN Plaza New York, N.Y. 10047  
Statement for AEC Public Hearing - Indian Point Unit no. 2

Objections to Safety Evaluation by the Division of Reactor Licensing,  
U. S. Atomic Energy Commission in the matter of Con-Edison Co. of N.Y.  
Indian Point Nuclear Generating Unit No. 2, Peekskill, N.Y.  
Docket No. 50-217

Basic facts:

"The site is located 2.5 miles from the center of Peekskill, N.Y., and approximately 24 miles north of New York City." (Page 5)

"The Indian Point #2 facility is the largest reactor that has been considered for licensing to date." (Appendix A: Advisory Committee on Reactor Safeguards, letter)

Objections:

1- "In view of the relatively high population density near the site and the large size of the reactor, the design objective of the containment vessel is to have negligible outleakage under accident conditions. This is achieved by a penetration pressurization system, a weld channel pressurization system, and a fluid line seal water system." (Page 4,5)

After stating similarity in "general design and operating objectives" of Indian Point II to Brookwood and Connecticut Yankee facilities,

"However, there are a number of respects in which this facility differs from Brookwood and Connecticut Yankee, the more important of which are the following:

"1. The population distribution in the vicinity of the site for the Indian Point 2 facility is higher than that of the other facilities. To compensate, the applicant has proposed a containment and engineered safeguards systems which are more extensive than that provided at facilities in less populated areas.

"2. The design objective of the containment vessel is to have negligible outleakage under accident conditions. To meet this objective, the Penetration Pressurization System (PPS) and the Isolation Valve Seal Water System (IVSWS) have been provided to preclude outleakage at all containment locations where leakage could be expected. ... " (Page 10)

The question: Since the Indian Point facility 2 would be the "largest reactor considered for licensing to date", according to ACRS above, and since it differs from Brookwood and Connecticut Yankee in meeting the objective of "negligible outleakage" by providing a Penetration Pressurization System and Isolation Valve Seal Water System, doesn't this make Indian Point # 2 an "experimental" plant, so far as the PPS and IVSWS are concerned?

Note statement on Page 47: "A system of this type in which the penetration is continuously pressurized has not been previously proposed for use in other licensed facilities."

Also, Page 48, with regard to IVSWS: "This design feature should eliminate this potential source of leakage." What experience has been garnered to support this claim?

- 2- "The Indian Point fuel rods will operate at somewhat higher specific power (up to 20.7 kw/ft) and central fuel temperature (up to 4250°F) than the other facilities." (Page 11)

This raises the same question about the experimental nature of Indian Point II.

- 3- "The American Standards Association and the Institute of Electronic and Electrical Engineers are actively engaged in the development of standards governing the design, testing, and installation of reactor protection systems. Some AEC staff members are participating directly in this effort to ensure the creation of quality standards and the proper implementation thereof. Evaluation of the Indian Point Unit No. 2 reactor protection system will be based on such standards, as they are proposed or adopted." (Page 15)

The wisdom of even considering a construction license for a large nuclear reactor, approximately 24 miles from New York City, when "standards governing the design, testing and installation of reactor protection systems" have not yet been fully developed, and the fact that the lives, health, and property of millions of people depend on such standards, makes it clear that there is no "reasonable assurance" of public health and safety in constructing Indian Point II.

- 4- Criterion 1 (b) states:  
"Performance standards that will enable the facility to withstand without loss of the capability to protect the public, the additional forces imposed by the most severe earthquakes, flooding conditions, winds, ice, and other natural phenomena anticipated at the proposed site." (Page 16)

What about unanticipated natural phenomena, such as the floods which threatened to knock out Midwest utilities, as reported in the New York Times, April 25, 1965. Philip Sporn was quoted in this N.Y. Times report as saying: "nothing within a tenth of this severity ever happened before. The devastation happened because we didn't dream it could ever be that bad."

If Mr. Sporn, one of our leading utility engineer-executives could make an admission like this, can we afford to gamble with the lives of millions of people, and the impossible problem of evacuating New York City, should something "ten times as severe" as anticipated occur at the Indian Point II site?

- 5- With regard to Criterion 5, Page 22 of the "Safety Evaluation" reads:  
"The applicant intends to continue studies of such instability. Further experimental information should be available from the San Onofre and Connecticut Yankee facilities by the time the Indian Point II facility is to operate."

Are we to understand from this that the safety of our population will depend in part "on experimental information" being available from atomic plants in California and Connecticut Yankee facility, "by the time the Indian Point II facility is to operate"?

- 6- "At the present time, there is little experience on operating pressurized water reactors with positive or zero temperature coefficients of reactivity. The limited experience to date has been derived at the SELNI reactor. This experience has provided support of the analytical techniques used to predict moderator temperature coefficients in plants of this type. In addition, prior to startup of the Indian Point II facility, detailed information to verify analytical techniques should be available from the San Onofre reactor." (Page 23)

Again, we find reference to "little experience" and dependency on the California reactor to provide information on a criterion of safety for Indian Point II.

- 7- "The applicant originally stated in the Report that a 5% zirconium-water reactor could occur if two of the three diesels provided were available to power the pumps of the safety injection system. However, more recent calculations have indicated that a zirconium-water reaction of about 10% might occur under the same conditions. Under these circumstances, about 20% of the fuel pellets would be exposed and could fall to the bottom of the reactor vessel. In our opinion, this amount of core damage would appear to be excessive, even though calculations indicate that the integrity of the pressure vessel would not be jeopardized.

"In consideration of the foregoing, the ACRS has recommended, and the staff agrees, that the flow capacity of the safety injection system should be increased and/or improvements should be made in other system characteristics, such as pump discharge pressure. In addition, the forces to be expected within the reactor vessel in the event of primary system failures must be carefully examined to ensure that the capability of the safety injection system is not impaired under these extreme conditions. We believe that these matters can be resolved during construction of the facility." (from Page 30 of the Safety Evaluation of Indian Point II)

It should be noted here that the Advisory Committee on Reactor Safeguards startled the nuclear industry, according to Nucleonics, January, 1966, by recommending "that sudden, catastrophic failure of a pressure vessel--since the start of the power reactor program classified as an incredible accident, one that need not be taken into account in reactor safety analyses, be reclassified as a possible accident; and that future nuclear power station plans design against the possible consequences of such an accident."

Has this possibility (of sudden, catastrophic failure of a pressure vessel) been taken into account in the maximum credible accident considered in this Safety Evaluation report by AEC's Division of Reactor Licensing?

Is the public interest being served by the belief of the AEC, as stated on Page 30 of this report, that "these matters can be resolved during construction of the facility"?

- 8- "The applicant has stated: 'The principal criterion of control station design and layout is that all controls, instrumentation displays and alarms required for the safe operation and shutdown of the plant are readily available to the operators in the control room.' (Page 36)

Since Consolidated Edison personnel will be operating the proposed atomic plant Indian Point II, public health and safety is entitled to assurance that Con-Edison is sufficiently responsible and efficient. It should be remembered, in this connection, that the Federal Power Commission raised serious questions about the efficiency of Con-Edison on the night of the blackout, November 9th.

The New York Times of December 12, 1965 reported that the F.P.C. blamed Con-Edison for failing to provide more explicit instructions to its engineer, and that had the Con-Edison engineer on duty moved quickly enough, the New York City area might not have been affected by the blackout.

Serious as this failure in efficiency and responsibility was, a similar failure in the event of an emergency at Indian Point II could be catastrophic.

- 9- "Also of concern are the potential adverse affects of fires originating in the control and safety system wiring and/or within the control room itself. In our opinion, a direct, analytical safety analysis relating to the possibility of reactivity excursions resulting from such fires is, in practice, impossible due to the random nature of fire damage and the nearly infinite variety of possible circuit faults (some 'unsafe', some 'safe') which could result. . . .

"In this connection, a literature search was conducted with the assistance of the computer facilities at the Nuclear Safety Information Center (NSIC) at Oak Ridge National Laboratory, to study the historical record of such excursions. NSIC has informed us that they were unable to find any records of incidents involving reactor damage as a result of fire-induced excursions." (Pages 37-38)

The Safety Evaluation then continues, with questionable logic since they have just admitted that a safety analysis of possible reactivity excursions resulting from fires is impossible, and that there are no records of previous experience with these: "Based on the foregoing considerations, we believe that Criterion 16 is satisfied."

How can the AEC, or the public, be satisfied, when potential adverse effects of fires are admitted to be "of concern", when a safety analysis of them is impossible, and when there are no records of incidents involving reactor damage as a result of fire-induced excursions, on which to base proper safeguards?

10- "As a backup to the normal standby AC power supply described above, diesel generator sets will be provided with the capability of starting and supplying the power requirements of the engineered safeguards as well as that equipment required to effect a normal facility shutdown. There will be three diesels that will automatically start on loss of voltage to the 480 volt bus stations. These can supply electrical power for the engineered safeguards, or equipment required for a normal shutdown. If only two diesels are assumed to operate, those safeguards required to preclude containment overpressurization and significant zirconium-water reaction can be adequately supplied. A normal shutdown could also be effected with two diesels in operation.

"All components and structures of the emergency power supply system are vital to safe shutdown and isolation of the reactor, and are, therefore, designed as Class 1 in terms of seismic design." (pages 51, 52)

Since I am not an engineer, I do not know whether this section of the Safety Evaluation is questionable or not. But in view of the fact that the emergency power supply system is "vital" to safe shutdown and isolation of the reactor, it should be remembered that following the November 9th blackout, the World-Telegram reported (Nov. 13, 1965): "Con Ed officials said they could not explain why automatic circuit breakers apparently did not cut out in time to save at least three power-drained generators in the city from damage. 'You'll have to talk to the engineers downtown.' Neubauer (John P. Neubauer, manager of system operations) said."

According to the Journal-American of Nov. 10, 1965:

"A spokesman for Con Edison explained today why four of the city's boroughs ... slid into darkness at approximately 5:28 o'clock last night. ...

"What should have happened is that automatic equipment should have cut us off from the interconnected system with upstate. The other alternative would have been to disconnect us manually. For some unexplained reason neither of these things happened."

Would it be possible for the "automatic" equipment and other components and structure of emergency power supply system "vital" to safe shutdown and isolation of the atomic reactor at Indian Point II to "fail" also--"for some unexplained reason"?

11- "Criterion 23 (from Page 55 of Safety Evaluation)  
"In determining the suitability of a facility for a proposed site the acceptance of the inherent and engineered safety afforded by the systems, materials and components, and the associated engineered safeguards built into the facility, will depend on their demonstrated performance capability and reliability and the extent to which the operability of such systems, materials, components, and engineered safeguards can be tested and inspected during the life of the plant."

It is difficult to see how Indian Point II meets the criterion of a "demonstrated performance capability and reliability" when Page 10 of the Safety Evaluation states this facility would differ from Brookwood and Connecticut Yankee;

Page 47 states: "A system of this type in which the penetration is continuously pressurized has not been previously proposed for use in other licensed facilities,"

Page 22 states: "Further experimental information should be available from the San Onofre and Connecticut Yankee facilities by the time the Indian Point II facility is to operate",

Page 15 states: "Evaluation of the Indian Point Unit No. 2 reactor protection system will be based on such standards, as they are proposed or adopted." (referring to work now being conducted to develop such standards),

and other safety considerations have been referred to by stating: "We believe that these matters can be resolved during construction of the facility" (Page 30)

Is it fair to the American public to build the largest atomic plant to be considered for licensing to date, without greater assurance of inherent safety than this?

12- "Solid waste will consist of miscellaneous contaminated rubbish and spent ion-exchanger resins. These will be packed in suitable containers of steel and concrete and shipped off-site." (Page 58)

In view of the large population in near-by New York City, and the record of transportation accidents involving radioactive wastes, the additional accumulation of both solid wastes and liquid wastes referred to in other sections of the Safety Evaluation, raise additional questions to the wisdom of building Indian Point Unit 2.

13- "...it should be recognized that a complete evaluation of potential accident consequences cannot be made until the final thermal, hydraulic, and physics parameters of the core have been determined. The consequences of these accidents will be evaluated by the applicant when final design details are available, and will be reviewed by the Staff prior to reactor operation." (Page 62)

How can a construction permit for Indian Point II, so close to a population of millions, be justified until all such information is available for evaluation of potential accident consequences?

From an economic viewpoint alone, how can the investment of millions of dollars, (whether this comes from Con-Edison's stock-holders, consumers, or the American taxpayer, through AEC subsidies), be justified-- when an operating license may never be granted because of questions related to safety which have not yet been answered?

Still another economic injustice is the fact that insurance is not available to home and building owners for radioactive contamination damage. Property owners in the area that would be affected should a major accident at Indian Point II occur, (and this is admitted to be possible) would stand to lose everything they have--their homes and businesses--in the event of such an accident, with only the inadequate Price-Anderson Indemnity of \$560 million to cover damages which could exceed \$7 billion dollars.

14- "Maximum Credible Accident

"The course and consequences of a double-ended failure of the primary coolant piping, the maximum credible accident, (MCA), were evaluated by the applicant. We believe that this accident represents the maximum potential for off-site consequences." Page 62

There is no mention in this Safety Evaluation of the estimates made by the AEC in its 1957 Brookhaven Report, "Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Power Plants" which estimated maximums of 3,400 killed, 43,000 injured, \$7 billion in property damage, and 150,000 square miles of land affected, as the result of a single major accident in an atomic plant of 500,000 kilowatts thermal power.

In a letter dated June 18, 1965, Glenn T. Seaborg, Chairman of the Atomic Energy Commission stated: "Reactors today are much larger than those in prospect in 1957, their fuel cycles are longer and their fission product inventories are larger. "Therefore, assuming the same kind of hypothetical accidents as those in the 1957 study, the theoretically calculated damages would not be less and under some circumstances would be substantially more than the consequences reported in the earlier study."

What would be the consequences of a major accident of the kind considered in the 1957 Brookhaven Report, at Indian Point II? (in terms of people killed, injured, property damage, and land affected?)

Again, the Brookhaven Report stated (Page 9): "Inhabitants of portions of the areas affected would have to be evacuated to avoid serious exposure."

Since Dr. Edward Teller has stated in an article, "Energy from Oil and from the Nucleus" (Journal of Petroleum Technology, May, 1965) that a "nuclear reactor could put its radioactive poison under a stable inversion layer and concentrate it onto a few hundred square miles in a truly deadly fashion"; isn't it possible that a major atomic plant accident at Indian Point II could create the impossible task of evacuating New York City--approximately 24 miles south of the proposed site for the "largest" reactor yet to be considered for licensing?

Pages 65-68 mention several "Minor Accidental Releases of Radioactivity": what of "major" releases, which however "improbable", are conceded to be "possible".

Can we afford to take the risks involved, when we remember the lesson of the "highly improbable" blackout of November 9, 1965?

Data on Evacuation in the event of a major atomic plant accident:

From AEC Brookhaven Report of 1957, based on 500,000 kw thermal reactor about 30 miles from a major city:

"Inhabitants of portions of the areas affected would have to be evacuated to avoid serious exposure. Access to various areas might be denied for different lengths of time, and the subsequent use of land for agricultural purposes might be curtailed, with possible loss of standing crops." (P. 9, 10)

"The Volatile Release Case:

Evacuation, Maximum 41,000 persons, \$205 millions (Page 12)

"The 50 Percent Release Case:

Evacuation, Maximum 460,000 persons \$2300 millions (Page 13)

The question must be raised:

If a major accident occurs at Indian Point II, isn't it possible that people in the New York City area could be exposed to "serious" levels of radioactivity? Since New York City, and its ten million inhabitants are merely 24 miles south of the proposed site for Indian Point II, isn't it possible that they might have the "serious exposure" as the result of such a major accident, which would ordinarily require the evacuation referred to in the Brookhaven Report quoted above?

If not, how many people in areas that would be affected, would require evacuation--and how great an area would remain inaccessible or uninhabitable for what length of time?

According to a report, "Planning for the Control of Radiation Accidents" prepared by Donald R. Chadwick, M.D.; Donald A. Pecsok, and Donald J. Nelson Jr., for presentation at a Seminar in Geneva, Switzerland, Nov. 18-22, 1963 "If major accidents should occur at nuclear reactors, fuel reprocessing or waste disposal facilities, fallout or spill releases to the environment may result. Such accidents may involve relatively large geographic areas, relatively large numbers of people or relatively high exposures. Coordinated planning is essential by all who might be involved operationally at the time of an accident, including the administration of the installation as well as official agencies." (page 11)

This raises another question: Is the coordinated planning now in effect sufficient to meet the emergency that a major accident at Indian Point II could create?

(Pages 6, 7)

The same report states: "Certain competencies in recognizing, reporting and initially controlling a radiation accident are required by police and fire department personnel who are most likely to be first on the scene." In view of the need to transport highly deadly radioactive wastes from Indian Point II, over public highways, are our police and fire departments prepared to deal with accidents involving the transportation of radioactive wastes?

- 15- In view of the unprecedented crisis which a major atomic plant accident at Indian Point II would create, the question of possible sabotage cannot be ignored. At the time of the blackout, the New York Times reported on November 11, 1965: "Military sources said that at the very least the blackout raised questions of possible sabotage in the future as a setup for surprise attack."

In this instance, a surprise attack would not be necessary. As Dr. Edward Teller has pointed out in his article, "Energy from Oil and from the Nucleus":

"But a powerful nuclear reactor which has functioned for some time has radioactivity stored in it greatly in excess of that released from a powerful nuclear bomb. There is one difference, and this difference makes the nuclear bomb look like a relatively safe instrument. In case of an atmospheric nuclear explosion the radioactivity ascends into the stratosphere. Relatively small amounts are deposited in the immediate neighborhood. ...

"A gently seeping nuclear reactor can put its radioactive poison under a stable inversion layer and concentrate it onto a few hundred square miles in a truly deadly fashion. This is why we must be exceedingly careful in constructing nuclear reactors, By being careful and also by good luck, we have so far avoided all serious nuclear accidents."

If these facts were widely recognized by the public, would they want to take the chance this statement implies?

To return to the question of possible sabotage, it is not widely known that several attempts were made to sabotage the nuclear submarine, Nautilus, (as reported in "Death of the Thresher" by Norman Polmar).

In addition to the possibility of a major accident at Indian Point II from human error, mechanical failure, fire, and more severe "natural phenomena" such as earthquakes than has been anticipated, we must also add the possibility of sabotage to the risks inherent in this atomic plant.

- 16- In his book, "Death of the Thresher" Norman Polmar quoted Admiral Rickover extensively on faults the Admiral had discovered in nuclear submarine construction. Admiral Rickover cited several instances of gross negligence on the part of "nearly every major electrode manufacturer in the United States".

We have only to consider the loss of the Thresher, and the highly disturbing facts uncovered by the investigation of this loss: the New York Times of January 10, 1965 reported that the investigation report "amounts to an indictment of the Navy's technical management, for throughout the hearings there is repeated evidence of poor design, violation of design plans, poor fabrication, poor workmanship and incomplete inspection." "...to wonder whether American industry is at present capable of offering "reasonable assurance" of public health and safety in the complex manufacturing processes necessary to the construction and operation of Indian Point II.

- 17- Additional objections are based on the following quotation from a statement by Dr. Theos J. Thompson at Hearings on Indemnity and Reactor Safety, (before the Subcommittee on Research, Development, and Radiation of the Joint Committee on Atomic Energy, April 10, 11, 1962, published under title "Indemnity and Reactor Safety").

Dr. Thompson, a former Chairman of the Advisory Committee on Reactor Safeguards, stated:

"In summary, we are still feeling our way cautiously in developing our faith in the reliability of power reactor cores. Every reactor that has been operated to date, unless it has had at least one almost exact prototype as is the case with submarine reactors, has demonstrated some small differences from expected behavior. Almost always these have not been important, but they seem to indicate that one should be very careful in locating a first of its kind (or size) reactor in a place where engineered safety is used exclusively." (Pages 66, 67) (emphasis added)

The proposed Indian Point II atomic plant would be the "largest reactor that has been considered for licensing to date", (see Appendix A of Safety Evaluation), and, according to Page 47 of the Safety Evaluation, "A system of this type in which the penetration is continuously pressurized has not been previously proposed for use in other licensed facilities."

These facts, and the few years that have passed since Dr. Thompson made this statement, makes his additional warning pertinent: "Let us not lose our heads in a pellmell dash for economic power at the expense of safety."

- 18- What system has been set up, and what system could suffice, to warn the public in the event of a major atomic plant accident at Indian Point II? The "highly improbable" blackout was self-evident. But how would the evacuation of people in the surrounding area of Indian Point II be effected, if this proves necessary?

In conclusion, we do not believe that the American public would be satisfied with the conclusion (3) of the Safety Evaluation (Page 71): "Research and development as required to resolve the safety questions with respect to the features and components which require research and development, will be conducted." (emphasis added)

In consideration of all the foregoing, we cannot agree that there is "reasonable assurance" that the Indian Point Unit 2 can be constructed and operated at the proposed site without endangering the health and safety of the public, as concluded on Page 72 of the Safety Evaluation.

UNITED STATES OF AMERICA

ATOMIC ENERGY COMMISSION

In the Matter of )  
)  
CONSOLIDATED EDISON COMPANY )  
OF NEW YORK, INC. )  
)  
(Indian Point Nuclear )  
Generating Station )  
Unit No. 2) )

Docket No. 50-247

CERTIFICATE OF SERVICE

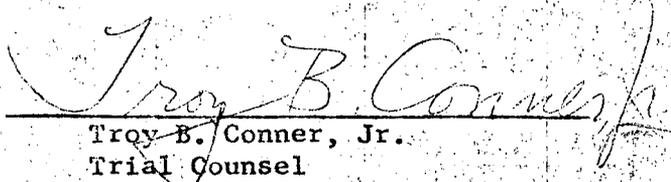
I hereby certify that a copy of the "Staff's Answer to the Conservation Center's 'Appeal from Initial Decision, Exceptions, and Brief in Support Thereof'", dated October 31, 1966, in the captioned matter has been served upon the following by deposit in the United States mail this 31<sup>st</sup> day of October, 1966:

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