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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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BEFORE THE COMMISSION

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

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In the Matter of )

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.)  
(Indian Point Unit 2) )

POWER AUTHORITY OF THE STATE OF NEW YORK )  
(Indian Point Unit 3) )

DOCKET NUMBER  
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50-247/286  
-SP

Docket Nos.  
50-207-SP  
50-286-SP  
25 Sept. 1984

UNION OF CONCERNED SCIENTISTS' COMMENTS ON STAFF  
BRIEFING CONCENING INDIAN POINT PROBABILISTIC RISK ASSESSMENT

On September 5, 1984, the Commissioners held a meeting to hear the Staff's position concerning the Indian Point probabilistic risk assessment. The other parties were sent a copy of the transcript and given an opportunity to comment.

This proceeding has been on going for five years. The ASLB issued a Recommended Decision almost a year ago and all parties submitted their comments on that decision to the Commission in February, 1984. Pursuant to a recent direction of the Commission, the parties submitted comments specifically directed to Judge Gleasen's dissent on August 13, 1984.

Since the Staff did nothing more at the September 5 Commission meeting than reiterate its testimony at the hearings, and since the intervenors in general and UCS in particular have

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already responded to the Staff's positions through testimony at the hearings, proposed findings of fact, and two previous sets of comments on the Recommended Decision to the Commission, we are frankly at a loss to understand what further comments might usefully be made in the absence of specific questions from the Commission.

The Intervenors' views concerning the Indian Point probabilistic risk assessment and closely related issues, and our detailed characterization of the evidence in these points can be found in the Intervenors' jointly-filed Proposed Findings of Fact and Conclusions of Law, July 11, 1983 at Section 2, pp. 1-16, Section 3, pp. 1-67, Section 12, pp. 1-16, Section 14, pp. 1-37 and in Section 16, Conclusions and Recommendations. They can also be found in Intervenors' Comments on Licensing Board Recommendations on Indian Point Units 2 and 3, February 6, 1984 and UCS Comments on Judge Gleasen's Dissent, August 13, 1984.

In our testimony and cross examination, detailed proposed findings tied to the hearing record and later submissions, the Intervenors have not only addressed ourselves to the technical minutiae of probabilistic analyses and the Indian Point PRA in particular, but also to the fundamental question, which the Staff and Licensees continue to evade, of whether any PRA yields

results of sufficient precision to allow an honest and intelligent answer to the question being addressed here, namely: what is the likelihood of an accident causing substantial death, injury and property damage? We believe, have testified, and have repeatedly cited much evidence and opinion supporting the conclusion that PRA, whatever its value is answering other questions pertinent to reaction safety such as highlighting systems of relative vulnerability, is subject to inherent uncertainties of such enormous magnitude when applied to this technology and is so subject to manipulation, as to make it incapable of yielding honest or remotely precise answers to the bottom-line risk question.

So far, there has been no direct or satisfactory response to the Intervenors' case on this point or to our detailed analyses of uncertainties. Indeed, the Staff professed itself unable to calculate the uncertainties involved. (Testimony of Blond and Rowsome, ff. Tr. 8778, IV. C-2) The general response can be characterized as "this is the best we can do" or "this is a state-of-the-art PRA." Neither is satisfactory. As we demonstrate again below, if the best we can do is estimate several accident probability within five orders of magnitude the exercise, while perhaps academically of interest, has not yielded useful results for a decision-maker to determine how "safe" a plant is.

A Perspective on the Board's Risk Conclusions (i.e., Understanding Them and Contrasting Them With Earlier Predictions)

Section D of the Commission's Order of May 30, 1980, directed the General Counsel and the Office of Policy Evaluation to establish a task force to prepare a report to the Commission based on information available at the time so that the Commission could determine whether the plants should be permitted to operate during the pendency of the proceeding. The "Task Force on Interim Operation of Indian Point" (composed of the NRC staff members), sent its report to the Commission via SECY-80-283 (June 12, 1980). It was later published as NUREG-0715.

The centerpiece of this effort was a "quick-and dirty" probabilistic risk assessment of Indian Point based on a brief review of the design of the Indian Point reactors compared with "insights" gained from the Reactor Safety Study, the Reactor Safety Study Methodology Applications Program, and the Interim Reliability Evaluation Program. The Commission based its decision allowing interim operation on the Task Force report and the Director's Decision setting out some short term plant modifications agreed to by Con Ed and PASNY. Consolidated Edison Co. of New York and Power Authority of the State of New York (Indian Point Units 2 and 3), DD-80-5, 11 NRC 351 (1980).

It should be noted that the Task Force report calculated that the plant improvements agreed to by the licensees and incorporated in the Director's Decision had a negligible effect on risk. Surprisingly, during the proceeding neither the NRC staff nor the licensees were able to quantify the impact on risk

of the measures implemented by the Directors Decision. It is obvious, in retrospect, that the Director' Decision provided little in the way of a basis for continued operation.

The results of the Task Force report included analyzed frequency estimates for core melt, early fatalities, early injuries, latent cancer fatalities, and offsite property damage. These results can be contrasted with the results obtained by the Board from their analysis of the record. In order to do this, we have summed the results for Indian Point Units 2 and 3 from SECY-80-283 (which consists of doubling the values since they were predicted to be the same for both units). In addition, we have applied a Gross National Product (GNP) escalator to the SECY-80-283 offsite property damage results to change them from 1974 dollars to 1982 dollars to make them roughly comparable with the ASLB's figures. In making this comparison, we assume for the purposes of illustration that the Board's analysis of the record is correct. The comparison follows:

<u>CONSEQUENCE</u>	<u>SECY-80-283, 1980</u>	<u>ASLB DECISION, 1983</u>	<u>DIFFERENCE</u>
Core Melt Frequency	$2.0 \times 10^{-5}$	$7.0 \times 10^{-4}$	35
Early Fatalities	$4.4 \times 10^{-4}$	$1.8 \times 10^{-4}$ to $3.8 \times 10^{-4}$	0.4 0.9
Early Injuries	$5.4 \times 10^{-4}$	$1.6 \times 10^{-1}$ to $2.4 \times 10^{-1}$	296 444
Latent Cancer Fatalities	$4.8 \times 10^{-4}$	$2.6 \times 10^{-1}$ to $2.9 \times 10^{-1}$	542 604

continued

<u>CONSEQUENCE</u>	<u>SECY-80-283, 1980</u>	<u>ASLB DECISION, 1983</u>	<u>DIFFERENCE</u>
Offsite Property Damage (\$1982)	$1.5 \times 10^{+3}$	$4.1 \times 10^{+5}$ to $4.5 \times 10^{+5}$	273 300

Thus, if we accept for the sake of argument the results in both SECY-80-283 and the ASLB recommendations, we now "know" that a core melt accident at Indian Point is roughly 35 times more likely than the Commission was originally informed, early fatalities resulting from accidents range from about the same likelihood to about half what the Commission was originally informed, early injuries are roughly 300 to 600 times more likely, latent cancer fatalities are roughly 550 to 600 times more likely, and offsite property damage is roughly 300 times larger on an annualized basis.

This entire exercise indicates the following: (a) both the probability and consequences of an accident at Indian Point are much greater than the Commission was led to believe in 1980, and/or (b) one can have no confidence in the accuracy of the numbers generated by risk assessments; they are almost laughably imprecise. It must also be kept in mind that the numbers presented above are "best estimates" and do not include the very large uncertainty bands that surround them.

When one considers the range of risk values found between the licensees' lower bound estimate of risk and the Board's upper bound estimate ("best estimate" values multiplied by an

NRC staff witness' intuitive guess on uncertainty bounds (Rowsome, FF. Tr. 8778, p. IV.C-19; Recommendations, pp. 101-102.) the numbers literally span more than five orders of magnitude. If what we "know", based on the PRA effort expended on the Indian Point proceeding, is that the probability of a serious accident (i.e., one causing large numbers of fatalities) is somewhere between one chance in a few thousand and one chance in several hundred million, we do not really "know" anything at all.

The Staff also claims that demographic differences between sites do not significantly affect estimated accident consequences. That is only true if the analysis assumes average conditions and an "average" accident, i.e. if risk is expressed as an average per reactor year of operation.\* If the analysis instead considers on a plant-by-plant basis, more severe than "average" weather conditions or a larger release, Indian Point consistently emerges with consequences not only far greater than the "average," but at the top of the list of all sites for virtually every measure of consequences. See Proposed Findings of Fact and Conclusions of Law, July 11, 1983 Section 14 at 1-16; Sholly Testimony, ff. Tr. 12730, pp. 8-11.

Further, the fact that there is a handful of sites almost as bad as Indian Point (e.g. Zion, Limerick) is surely not a rational basis for concluding that the consequences of a severe accident are tolerable at Indian Point. Indeed, it wa

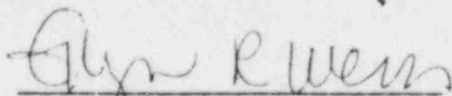
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\* See Intervenors' Comments on Licensing Board Recommendations on Indian Point Units 2 and 3, Feb. 6, 1984, pp. 9-10.

recognized at the outset of this proceeding by The Commission that the policy questions to be addressed would apply to a class of high population density sites, of which Indian Point was the exemplar. The hearings were established as part of a "four-pronged approach for resolving the issues raised by the UCS petition". Commission Order, May 30, 1980, Docket Nos. 50-247, 50-286, Sl.op. at 2. The third prong was the Commission's undertaking of a "generic consideration of the question of operation of reactors in areas of high population density." Id. Thus, the Staff's and Licensee's observations that Indian Point is not "unique," even if true, is beside the point. The hearings have shown what it was expected that they would show: that for a small group of unfavorable sites, with Indian Point at the top of the list, a serious accident would have great consequences. The hearings have also confirmed that we do not know how probable such an accident is or when it may occur.

UCS submits that it is time for a decision to be made.

Respectfully submitted,



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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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BEFORE THE NUCLEAR REGULATORY COMMISSION

In the matter of	)	
	)	
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. (Indian Point, Unit No. 2)	)	Docket Nos. 50-247 SP
	)	50-286 SP
POWER AUTHORITY OF THE STATE OF NEW YORK (Indian Point, Unit No. 3)	)	September 26, 1984

CERTIFICATE OF SERVICE

I hereby certify that copies of "UNION OF CONCERNED SCIENTISTS' COMMENTS ON STAFF BRIEFING CONCERNING INDIAN POINT PROBABILISTIC RISK ASSESSMENT" have been served on the following persons by deposit in the United States mail, first class postage prepaid, this 26th day of September 1984.

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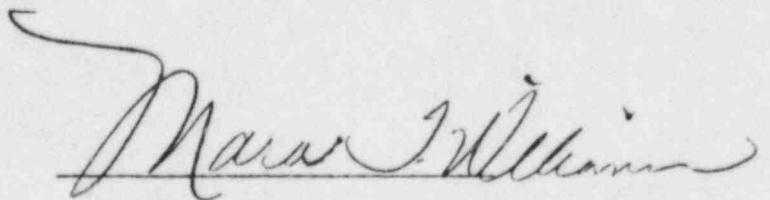
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