

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

'82 DEC 30 A11:44

In the Matter of)

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

Docket Nos. 50-247-SP
50-286-SP

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

24 December 1982

UCS/NYPIRG SUPPLEMENTAL RESPONSE TO
LICENSEES' FIRST SET OF INTERROGATORIES
UNDER COMMISSION QUESTION ONE

Introduction

On June 16, 1982, Consolidated Edison Company of New York, Inc., and the Power Authority of the State of New York ("the Licensees") filed "LICENSEES' FIRST SET OF INTERROGATORIES AND DOCUMENT REQUESTS UNDER COMMISSION QUESTION 1 TO UNION OF CONCERNED SCIENTISTS/NEW YORK PUBLIC INTEREST RESEARCH GROUP, INC., FRIENDS OF THE EARTH, INC., NEW YORK CITY AUDUBON SOCIETY, AND PARENTS CONCERNED ABOUT INDIAN POINT". UCS/NYPIRG responded to this filing on July 23, 1982. Pursuant to discussions between counsel for the Licensees and counsel for UCS/NYPIRG, it was agreed that answers to the following interrogatories from Licensees' first set on Commission Question One would be supplemented to the extent possible: 2, 4, 5, 9, 10, 22, 28, 41, 43, 47, 48, 49, 50, 53, 55, 56, 71, 72, 75, and 78. Supplemental responses are

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provided below. A signed and notarized affidavit will be supplied as soon as possible; an unsigned copy is affixed in order that the Licensees may know the identity of the preparer.

Supplemental Response to #2

Licensees are already in receipt from the NRC Staff of copies of the Sandia National Laboratories' "draft" review of IPPSS, dated August 25, 1982; in addition, Licensees participated in a meeting with the NRC Staff and representatives from Sandia to discuss the "draft" review.

UCS/NYPIRG witness Robert Weatherwax is reviewing the IPPSS study; he has not completed this review, nor has any written evaluation been generated as of this date. UCS Technical Research Associate Steven Sholly has reviewed portions of the IPPSS; no written documents document this review, other than marginal notes. The following specific criticisms of the IPPSS have been identified in this review:

- (a) The study appears to ignore pressurized thermal shock as an initiating event leading to core melt;
- (b) The accident consequences model (CRACIT) appears to have failed to consider the impact of external events on the alert and notification system (i.e., sirens and route alerting) and on emergency communications; it would seem probable that any external event such as an earthquake or hurricane with sufficient severity as to initiate a core melt accident would also severely disrupt offsite communications and travel routes, thus presenting considerable difficulties in effectuating any protective actions; as a general indicator, the Reactor Safety Study concluded that an ineffective

evacuation would nearly double the number of early fatalities in the most severe accident conditions evaluated in that report;

- (c) The extensive use of Bayesian probabilistic methodology represents an area of uncertainty which has not yet been fully evaluated;
- (d) The consequences evaluated do not include property damage, genetic effects, nor societal consequences such as job losses, loss of resources (such as water supplies or facilities such as West Point); thus, the full societal impact of core melt accidents with releases to radioactivity to the environment are not evaluated in the IPPSS and, therefore, risk is not fully evaluated;
- (e) The IPPSS assumes no acts of malevolence (sabotage) as accident initiators, thus introducing what may be a substantial uncertainty in the estimates of risk; Indian Point may be a more visible and attractive target for sabotage due to the proximity of the plant to New York City and the media located there, as well as the stories appearing in the press over the last several years regarding problems with the security force;
- (f) The human errors evaluation in the IPPSS appears to ignore acts of commission in response to core melt accidents; in addition, "latent" errors such as those caused by incorrect or inadequate or unclear emergency procedures are also apparently ignored;
- (g) The prediction of failure pressure for the containments apparently ignores possible design, fabrication, or installation flaws, any of which singly or in combination could result in a structural weakness which might be sufficient to result in containment failure at a much lower pressure than postulated in IPPSS; in addition, the IPPSS appears to ignore failures of containment penetration seals as a failure mode;
- (h) The consequences model accepts the LD-50/60 dose of 510 Rads given in the CRAC model for CRACIT; it is probably more realistic to use the "lower bound" level of 340 Rads from WASH-1400's dose-response curves given the lack of preparation of the medical community to deal with large numbers of radiation exposure victims and the problems inherent in readily identifying who has been sufficiently exposed as to benefit from "supportive treatment" which is

implicit in the LD-50/60 dose of 510 Rads; and

- (g) The IPPSS fails to include CCDF curves which makes it difficult to compare the risks with those posed by other reactor-site combinations.

Supplemental Response to #4

UCS/NYPIRG starts by its previous response which referred Licensees to the response to Interrogatory #3. We also note, however, that uses of PRA methodology might include determination of risk reduction (in a relative sense) of various mitigation features, ranking of safety problems by their relative severity (taking due note of uncertainties), and in comparisons of specific features from plant to plant to ascertain differences in performance.

Supplemental Response to #5

As with our prior response, we have generated no such criticisms in the form of written documents. UCS/NYPIRG has been awaiting the completion of this report (i.e., the issuance of Volume 2). We now understand from UCS/NYPIRG's deposition of NRC Staff witness James Meyer that Volume 2 may not be completed in time for the Indian Point special investigation. UCS has filed a Freedom of Information Act request related to Volume 2 of NUREG-0850 and will inform Licensees of any documents produced by the NRC in response to this request.

A principal criticism of Volume 1 of NUREG-0850 is the NRC Staff's apparent plan to propose a system of "heat pipes" as a passive means of removing heat from containment as part of

a three-part accident mitigation package which also includes a flooded cavity concept for core retention and igniters for hydrogen gas control. Based on preliminary information about this system, it would appear that the heat pipe concept would involve the necessity for one and probably multiple fresh containment penetrations in order to implement the concept. Such new penetrations will change the structural nature of the containment, and might do more harm than good. Further, there would appear to be some degree of problem with qualifying the heat pipes for the seismic events that IPPSS found to dominate risk for the Indian Point reactors. We continue to believe that filtered vented containments or compartment venting systems offer a greater degree of reliability in this regard.

Supplemental Response to #9

Licensees have already been provided with this information on December 17, 1982, in the notification of witnesses on Commission Question One.

Supplemental Response to #10

If this Interrogatory is limited to Commission Question One, there are no additional persons to list in response.

Supplemental Response to #22

The analysis referenced in the original response has not been performed. It may be that it will not be performed due to

the tight schedule under which the proceeding is now operating. UCS/NYPIRG is unaware of any other such evaluation, however, compliance with the Regulatory Guide or an equivalent system would be necessary to a showing that the instrumentation provided to operators is sufficient to ensure an adequate response to accidents.

Supplemental Response to #47

UCS/NYPIRG has performed no such evaluations. As noted previously, such evaluations have been performed by the NRC Staff using the CRAC code, and an evaluation based on a larger reactor (1120 MWe) has been performed by Sandia National Laboratories using the CRAC2 model (microfiche available in NRC's Public Document Room for both studies). The methods and assumptions are detailed in user's guides for the two codes which are available in the NRC's Public Document Room or from UCS, Washington, D.C., office. In addition, evaluation methods for evaluating the impacts of accidents on job loss and on specific economic subclasses (i.e., various manufacturing and agricultural activities) are detailed in NUREG/CR-2591, available from the NRC's Public Document Room. From discussions with the authors and the NRC technical monitor for the contract, we understand that an evaluation specific to Indian Point has not been performed. Also, considerations related to societal economic and other impacts which are not evaluated in the CRAC or CRAC2 codes are detailed in J.M. Griesmeyer, T.E. McKone, and

W.L. Baldewicz, "Management of Potential Resource Losses Due to Nuclear Power Plant Accidents", August 1982, available from Dr. Thomas E. McKone, Advisory Committee on Reactor Safeguards, 1717 H Street, Washington, D.C. 20555. This report notes at page 5 that a potential resource loss for Indian Point in the event of an "SST1" release would be the Croton Reservoir, with a capacity of 65.3 billion gallons of fresh water, which the report notes "provides much of the New York City water supply".

Supplemental Response to #48

The NRC's CRAC code evaluation for Indian Point, which is available in the NRC's Public Document Room in microfiche form, and the Sandia evaluation using CRAC2, similarly available, demonstrate the basis for this allegation adequately. These evaluations project early fatalities alone of up to 20,000 or more from especially severe accidents. The problems faced by the medical community would be more severe, however, since more persons than those identified above would require "supportive treatment" in order to survive, and, in addition, there are no presently available means for rapidly and accurately assessing who among many tens of thousands of persons suffering from radiation-related illnesses have received sufficient exposure to require more than "minimal treatment". This problem will be aggravated by the fact that there are no means by which to assure that all potentially exposed victims proceed to reception centers for monitoring, and

the fact that persons will be responding to medical facilities for treatment which are not adequately prepared to handle contamination or large numbers of exposed persons.

Supplemental Response to #49

a. Those specified in the CRAC and CRAC2 consequence assessment codes and their respective code descriptions, including Appendix VI of WASH-1400. See, also, J.M. Griesmeyer, et. al., referenced in Supplemental Response to #47.

b. See Appendix VI of WASH-1400 and J.M. Griesmeyer, et. al., referenced in Supplemental Response to #47.

c. Based on NRC Staff CRAC code results of the number of persons receiving whole-body doses of 200 Rems or more, the number could range into the hundreds of thousands for Indian Point.

d. This number will be a subset of that given in "c" above. Not all irradiated persons will necessarily be contaminated.

e. Already answered--see Appendix VI to WASH-1400.

Supplemental Response to #50

The documents are available in the NRC's Public Document Room, except for J.M. Griesmeyer, et. al., which is available as noted in Supplemental Response to #47.

Supplemental Response to #53

This allegation is also based in part on the limited liquid pathway analysis presented in NUREG-0850, Vol. 1. The detailed

version of this analysis has not been provided to UCS/NYPIRG and is to the best of our knowledge not yet published.

Supplemental Response to #55

As noted elsewhere in this response, the methodology exists to perform such studies, but so such studies have been carried out for Indian Point. Some of these values (i.e., b and c) may be estimated from the CRAC and CRAC2 results for Indian Point referenced above. Others (e, f, g, and h) are discussed in J.M. Griesmeter, et. al., in a generic sense and to a limited extent specific to Indian Point. Regarding item d, see NUREG/CR 2723, a draft Sandia report which details calculations of health-related costs; UCS/NYPIRG does not necessarily endorse this methodology, but merely brings it to the Licensees' attention as a possible means of performing such calculations.

Supplemental Response to #56

Licensees should refer to the source documents for this information (code descriptions for CRAC and CRAC2, WASH-1400 Appendix VI, J.M. Griesmeyer, et. al., draft NUREG/CR-2723, and NUREG/CR-2591).

Supplemental Response to #71

In addition, a principal problem with comparisons of nuclear energy and non-nuclear energy risks are the uncertainties in the risk estimates. See, DOE-EV-0109, P.W. House, et. al., "Comparing Energy Technology Alternatives from an Environmental

Perspective", U.S. Department of Energy, February 1981.

Supplemental Response to #72

Listed in Supplemental Response to #71. See, also, William W. Lowrance, On Acceptable Risk.

Supplemental Response to #75

In addition, unless identical methods, data bases (where applicable), and assumptions are used for both studies for which a comparison is attempted, the comparison is very sensitive to these factors. These differences can completely dominate the comparison if significant. For example, the IREP reports contain a specific caution not to compare the results with WASH-1400 due to the use of different methodologies and data base (NUREG/CR-2515, SAND81-7229/1, A.A. Garcia, et. al., "Crystal River-3 Safety Study, Volume I - Main Report", Science Applications, Inc., for the U.S. Nuclear Regulatory Commission, December 1981, page I-i).

Supplemental Response to #78

In short, the answer is no. Both IPPSS and WASH-1400 fail to address initiating conditions other than full power and normal conditions. Neither study addresses all of the Unresolved Safety Issues. Neither study adequately accounts for actual operational experience with accidents in other facilities. Neither study adequately accounts for human errors, especially latent

errors and errors of commission. Neither study considered sabotage adequately. Neither study adequately addressed design, fabrication, or installation errors. The accuracy of such studies in an absolute sense is open to serious question and large uncertainties. Other risk studies have not been reviewed in sufficient detail to permit a response, nor are other risk studies necessarily relevant to the risk posed by Indian Point.

Supplemental Response to #28

Upon reflection, UCS/NYPIRG has nothing to add to the earlier response.

Supplemental Response to #41

Additional information regarding probabilities of PWR-2 releases can now be found in NUREG/CR-2239, which includes a "generic" estimate of the probability for an SST1 release, which includes PWR-2.

Supplemental Response to #43

Contamination is defined as the excess amount of radioactivity present above background levels for the area.

DATED: 24 December 1982

RESPECTFULLY SUBMITTED,

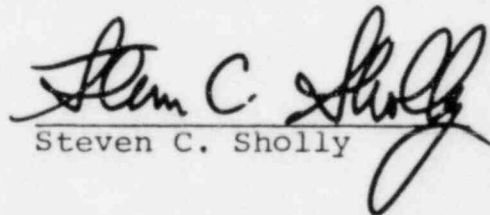
Jeffrey M. Blum / *js*
Jeffrey M. Blum, Esq.
Counsel for UCS

VERIFICATION

DISTRICT OF COLUMBIA) :S.:

I, STEVEN C. SHOLLY, being duly sworn, depose and say:

That I am Technical Research Associate for the Union of Concerned Scientists; that I am authorized to make this verification on behalf of UCS/NYPIRG; and that the foregoing answers to Interrogatories were prepared under my direction and supervision and are true and correct to the best of my knowledge, information, and belief.


Steven C. Sholly

Sworn to before me this
28th day of December 1982



Notary Public

My Commission expires
October 31, 1986