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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the matter of )

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC. )  
(Indian Point, Unit No. 2) )

POWER AUTHORITY OF THE STATE OF NEW YORK )  
(Indian Point, Unit No. 3) )

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

) 3 December 1982  
)

UCS/NYPIRG RESPONSE TO NRC STAFF FIRST SET  
OF INTERROGATORIES AND REQUEST FOR DOCUMENTS  
CONCERNING COMMISSION QUESTIONS 1 AND 2

Introduction

Pursuant to Board Order dated , UCS/NYPIRG hereby files the following responses to the NRC Staff's interrogatories dated July 16, 1982. Pursuant to telephone conversation between UCS/NYPIRG and counsel for NRC Staff, these responses are being filed one day late.

Response to Interrogatory 1

NRC Staff interrogatory 1 states as follows:

"Identify all documentary or other material that you intend to use during this proceeding to support Contentions 1.1 and 2.1 and that you may offer as exhibits on this contention or refer to during your cross-examination of witnesses presented by Consolidated Edison Company of New York, Inc., Power Authority of the State of New York, or the NRC Staff."

As of this date, UCS/NYPIRG has identified the following documents are responsive to the Staff's request:

1. UCLA-ENG-7775, B. Gossett, et. al., "Post-Accident Filtration as a Means of Improving Containment Effectiveness", UCLA School of Engineering and Applied Science, December 1977.
2. NUREG/CR-2228, BNL-NUREG-51415, W.T. Pratt and R.A. Bari, "Containment Response During Degraded Core Accidents Initiated by Transients and Small Break LOCA in the Zion/Indian Point Reactor Plants", Brookhaven National Laboratory, July 1981.
3. NUREG/CR-2549, SAND82-0324, Thomas E. Blejwas, et. al., "Background Study and Preliminary Plans for a Program on the Safety Margins of Containments", Sandia National Laboratories, May 1982.
4. NUREG/CR-2155, SAND81-0416, John L. Darby, "A Review of the Applicability of Core Retention Concepts to Light Water Reactor Containments", Sandia National Laboratories, September 1981.
5. NUREG/CR-2569, LA-9301-MS, T.A. Butler and L.E. Fugelso, "Response of the Zion and Indian Point Containment Buildings to Severe Accident Pressures", Los Alamos National Laboratory, May 1982.
6. NUREG-0850, Vol. 1, Office of Nuclear Reactor Regulation, U.S. NRC, "Preliminary Assessment of Core Melt Accidents at the Zion and Indian Point Nuclear Power Plants and Strategies for Mitigating Their Effects: Analysis of Containment Building Failure Modes", November 1981.
7. NUREG/CR-1409, SAND80-0617, Walter B. Murfin, "Summary of the Zion/Indian Point Study", Sandia National Laboratories, April 1980.
8. NUREG/CR-1410, SAND80-06176/1, W.B. Murfin, "Report of the Zion/Indian Point Study, Volume 1", Sandia National Laboratories, August 1980.
9. NUREG/CR-1411, LA-8306-MS, M/G. Stevenson, compiler, "Report of the Zion/Indian Point Study, Volume II", Los Alamos Scientific Laboratory, April 1980.
10. PU/CEES Report #94, Jan Beyea and Frank von Hippel, "Nuclear Reactor Accidents: The Value of Improved Containment", Center for Energy and Environmental Studies, Princeton University, January 20, 1980.

11. Jan Beyea and Frank von Hippel, "Containment of a Reactor Meltdown", Bulletin of the Atomic Scientists, August/September 1982, pages 52-59.
12. NUREG/CR-0165, SAND77-1344, David D. Carlson and Jack W. Hickman, "A Value-Impact Assessment of Alternate Containment Concepts", Sandia Laboratories, June 1978.
13. NUREG/CR-1029, SAND79-1088, Allan S. Benjamin, "Program Plan for the Investigation of Vent-Filtered Containment Conceptual Designs for Light Water Reactors", Sandia Laboratories, October 1979.
14. Michael B. Weinstein, "Primary Containment Leakage Integrity: Availability and Review of Failure Experience", Nuclear Safety, Vol. 21, No. 5, September-October 1980, pages 618-632.
15. R.S. Denning and P. Cybulskis, "Reduction in Reactor Risk by the Mitigation of Accident Consequences", Nuclear Safety, Vol. 22, No. 2, March-April 1981, pages 165-172.
16. SAND80-0887, A.S. Benjamin and H.C. Walling, "Development and Analysis of Vent-Filtered Containment Conceptual Designs", Sandia National Laboratories, undated.
17. K. Johansson, et. al., "Design Considerations for Implementing a Vent-Filter System at the Barseback Nuclear Power Plant", FILTRA LOG NO. 255, paper intended for presentation at the International Meeting on Thermal Nuclear Reactor Safety, August 29-September 2, 1982, Chicago, Illinois. The authors are affiliated with Studsvik Energiteknik, ASEA-ATOM, and Sydkraft in Sweden.
18. NUREG-0340, I.B. Wall, et. al., "Overview of the Reactor Safety Study Consequence Model", October 1977, U.S. NRC.
19. NUREG/CR-2239, SAND81-1549, D.C. Aldrich, et. al., "Technical Guidance for Siting Criteria Development", Sandia National Laboratories, November 1982, U.S. NRC.
20. NUREG-0139, Supplement No. 1, "Supplement to Final Environmental Statement Related to Construction and Operation of Clinch River Breeder Reactor Plant", U.S. NRC.
21. NUREG/CR-2591, J.V. Cartwright, et. al., "Estimating the Potential Impacts of a Nuclear Reactor Accident: Methodology and Case Studies", U.S. Department of Commerce, April 1982, U.S. NRC.
22. J.M. Griesmeyer, et. al., "Management of Potential Resource Losses Due to Nuclear Power Plant Accidents",

August 1982, submitted for review and possible publication to American Journal of Public Health. Authors are with ACRS staff or are ACRS fellows; contact Dr. Thomas McKone, ACRS Fellow.

23. NUREG/CR-1659, Vols. 1-4, RSSMAP reports for Calvert Cliffs, Unit 2; Sequoyah, Unit 1; Grand Gulf, Unit 1; and Oconee, Unit 3; U.S. NRC.
24. NUREG/CR-2515, NUREG/CR-2787, and NUREG/CR-2802, IREP reports for Crystal River, Unit 3; Arkansas Nuclear One, Unit 1; and Browns Ferry, Unit 1; U.S. NRC.
25. SAND-78-0556, Jeremy L. Sprung, "An Investigation of the Adequacy of the Composite Population Distributions Used in the Reactor Safety Study", Sandia Laboratories, October 1978.
26. Subcommittee on Oversight and Investigations, "Calculation of Reactor Accident Consequences (CRAC2) for U.S. Nuclear Power Plants (Health Effects and Costs) Conditional on an 'SST1' Release", and "List of Sites with the Highest Scaled Consequences Based on NRC CRAC2 Accident Consequence Analysis", November 1, 1982, House Committee on Interior and Insular Affairs, Subcommittee on Oversight and Investigations.
27. NUREG-0715, R.M. Bernero, et. al., "Report of the Task Force on Interim Operations of Indian Point", June 1980, SECY-80-283, U.S. NPC.
28. F.H. Fuchs, "Analysis of Nuclear Reactor Events Reported in March 1979", May 1979, Xzyzx Information Corporation, attachment to a letter dated 18 May 1979 from Kay Inaba to Hugh Warren, located in FOIA-80-515, Madden, in NRC Public Document Room.
29. Memo dated 26 April 1982 from Richard C. DeYoung to William J. Dircks, Subject: "Actions on Incident Response Comments", plus four enclosures.
30. E.W. Hagen, "Common-Mode/Common Cause Failure: A Review", Nuclear Safety, Vol. 21, No. 2, March-April 1980, pages 184-192.
31. Memo dated 18 January 1979 from Samuel J. Chilk to Lee V. Gossick, Subject: "Staff Actions Regarding Risk Assessment Review Group Report".
32. NRC Press Release no. 79-19, dated 19 January 1979, "Nuclear Regulatory Commission Issues Policy Statement on Reactor Safety Study and Review by Lewis Panel".

33. George Apostolakis, "Probability and Risk Assessment: The Subjectivistic Viewpoint and Some Suggestions", Nuclear Safety, Vol. 19, No. 3, May-June 1978, pages 305-315.
34. W.R. Corcoran, et. al., "Nuclear Power-Plant Safety Functions", Nuclear Safety, Vol. 22, No. 2, March-April 1981, pages 179-191.
35. NUREG/CR-0603, BNL-NUREG-50950, R.E. Hall, et. al., "A Risk Assessment of a Pressurized Water Reactor for Class 3-8 Accidents", Brookhaven National Laboratory, October 1979, U.S. NRC.
36. Letter dated 9 June 1982, from P. Shewman, ACRS, to Nunzio Palladino, NRC, Subject: "Comments on Proposed Policy Statement on Safety Goals for Nuclear Power Plants (NUREG-0880, A Discussion Paper)", and additional comments by M. Bender, and H.W. Lewis.
37. SAND79-0095, D.C. Aldrich, et. al., "Effect of Revised Evacuation Model on Reactor Safety Study Accident Consequences", Sandia Laboratories, February 1979.
38. NUREG/CR-1150, SAND79-2081, D.C. Aldrich, "Impact of Dispersion Parameters on Calculated Reactor Accident Consequences", Sandia Laboratories, November 1979.
39. NUREG-0209, SAND76-0746, J.R. Wayland, "Conditional Probability of Intense Rainfall Producing High Ground Concentrations from Radioactive Plumes", Sandia Laboratories, March 1977.
40. NUREG-0174, SAND76-0618, J.L. Sprung and H.W. Church, "Sensitivity of the Reactor Safety Study Consequence Model to Mixing Heights", Sandia Laboratories, December 1976.
41. NUREG-0175, SAND76-0619, J.L. Sprung and H.W. Church, "Effects of Wind Shear on the Consequence Model of the Reactor Safety Study", Sandia Laboratories, December 1976.
42. NUREG/CR-0400, H.W. Lewis, et. al., "Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission", Ad Hoc Review Group, September 1978.
43. NUREG-0784, "Long Range Research Plan: FY 1984-FY 1988", Office of Nuclear Regulatory Research, U.S. NRC, August 1982.
44. NUREG/CR-2300, "PRA Procedures Guide", Rev. 1, April 5, 1982, U.S. NRC.

59. Letter dated 5 August 1980 from Richard S. Denning to Robert Bernero, plus attachments.
60. D.C. Aldrich, et. al., "International Standard Problem for Consequence Modeling: Results", paper presented at Port Chester ANS/ENS meeting on Probabilistic Risk Assessment, September 1981.
61. Jan Beyea, "The Impact on New York City of Reactor Accidents at Indian Point", June 11, 1979, corrected June 20, 1979, presented to New York City Council.
62. Memo dated 30 April 1980 from Brian K. Grimes to Harold R. Denton, Subject: "Candidate Sites for Risk Studies", and attachments.
63. Memo dated 13 August 1980 from Jim Martin to S. Acharya, et. al., Subject: "Results of Some Scoping Calculations, RE: Siting Work", and attachments.
64. Draft memo dated 1 February 1980 by Roger Blond, contained as attachment to letter dated April 9, 1980 from Harold R. Denton to Cordell Reed.
65. G.D. Kaiser, et. al., "Environmental Transport and Consequence Analysis", paper presented at Port Chester ANS/ENS meeting on Probabilistic Risk Assessment, September 1981.
66. Dean C. Kaul, "The Effect of Plume Depletion Model Variations on Risk Assessment Uncertainties", paper presented at Port Chester ANS/ENS meeting on Probabilistic Risk Assessment, September 1981.
67. G.D. Kaiser, "Plume Rise and Nuclear Safety Studies", paper presented at Port Chester ANS/ENS meeting on Probabilistic Risk Assessment, September 1981.
68. D.R. Strip, et. al., "Sandia Nuclear Power Plant Siting Study", paper presented at Port Chester ANS/ENS meeting on Probabilistic Risk Assessment, September 1981.
69. M. Levenson and F. Rahn, "Realistic Risk Estimates", IAEA Bulletin, Vol. 23, No. 4, pages 37-39.
70. H.A. Morewitz, "Fission Product and Aerosol Behavior Following Degraded Core Accidents", Nuclear Technology, Vol. 53, May 1981, pages 120-134.
71. M. Levenson and F. Rahn, "Realistic Estimates of the Consequences of Nuclear Accidents", Nuclear Technology, Vol. 53, May 1981, pages 99-110.

72. SECY-81-25, memo dated 12 January 1981 from William J. Dircks to NRC Commissioners, Subject: "Performance of Probabilistic Risk Assessment or Other Types of Special Analyses at High Population Density Sites", and attachments.
73. H.W. Kendall, et. al., "The Risks of Nuclear Power Reactors: A Review of the NRC Reactor Safety Study WASH-1400 (NUREG-75/014)", Union of Concerned Scientists, August 1977.
74. Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs, House of Representatives, "Reactor Safety Study Review", Serial No. 96-3, 1979.
75. Subcommittee on Energy and the Environment of the Committee on Interior and Insular Affairs, House of Representatives, "Reactor Safety Study (Rasmussen Report)", Serial No. 94-61, 1976.
76. Jan Beyea, PU/CEES Report No. 61, "A Study of Some of the Consequences of Hypothetical Reactor Accidents at Barseback", January 1978.
77. MHB Technical Associates, "Swedish Reactor Safety Study: Barseback Risk Assessment", prepared for the Swedish Energy Commission, January 1978.
78. NUREG/CR-1244, SAND79-0376, L.T. Ritchie, et. al., "Impact of Rainstorm and Runoff Modeling on Predicted Consequences of Atmospheric Releases from Nuclear Reactor Accidents", Sandia National Laboratories, February 1980.
79. NUREG/CR-1131, SAND78-0454, D.C. Aldrich, et. al., "Examination of Offsite Radiological Emergency Measures for Nuclear Reactor Accidents Involving Core Melt", Sandia Laboratories, June 1978.
80. NUREG/CR-2723, SAND82-1110, D.R. Strip, "Estimates of the Financial Consequences of Nuclear Power Reactor Accidents", Sandia National Laboratories, September 1982.
81. L.T. Ritchie, et. al., "Calculations of Reactor Accident Consequences, Version 2", DRAFT, Sandia National Laboratories, 27 July 1981.
82. NUREG/CR-2326, DRAFT, L.T. Ritchie, et. al., "Calculations of Reactor Accident Consequences, Version 2: Computer Code Input Data Description", undated, Sandia National Laboratories.

83. R. Blond, "Reactor Safety Study Consequence Model, COMO, Computer Code User's Manual", DRAFT, 6 January 1977, U.S. NRC.
84. Z.T. Mendoza and R.L. Ritzman, "Final Report on Comparative Calculations for the AEC and CRAC Risk Assessment Codes", SAI-078-78-PA, Science Applications, Inc., for CRBRP Project Office, December 1978.
85. NUREG/CR-2453, BNL-NUREG-51485, A.J. Buslik and R.A. Bari, "National Reliability Evaluation Program (NREP) Options Study", Brookhaven National Laboratory, January 1982, U.S. NRC.
86. Viewgraphs of Gregory C. Mior, November 10, 1977, meeting of Risk Assessment Review Group.
87. Viewgraphs of Richard B. Hubbard, November 10, 1977, meeting of Risk Assessment Review Group.
88. Viewgraphs of William D. Rowe, EPA, November 10, 1977, meeting of Risk Assessment Review Group.
89. Letter dated 18 October 1976 from Saul Levine to Joel Yellin, plus attachment.
90. Letter dated 7 November 1977 from Lee V. Gossick to Joel Yellin, plus attachments.
91. Letter dated 3 December 1976 from Saul Levine to Joel Yellin, plus attachments.
92. L.T. Ritchie, et. al., "Weather Sequence Sampling for Risk Calculations", undated paper obtained from Roger M. Blond, U.S. NRC.
93. Memo dated 20 August 1981 from R.M. Bernero to Distribution, plus attachments.
94. Mohan C. Thadani, DRAFT, "NRC Staff Testimony of Mohan C. Thadani Regarding the Restart of the Three Mile Island Nuclear Station Unit No. 1", undated, from FOIA-80-515, Madden, NRC Public Document Room.
95. Draft Preliminary Results, U.S. NRC, response dated 17 September 1981 to FOIA-81-283, Shotwell.
96. NUREG-0348, "Demographic Statistics Pertaining to Nuclear Power Reactor Sites", U.S. NRC, October 1979.



97. NUREG/CR-2040, BNL-NUREG-51367, S. Mitra, et. al., "A Study of the Implications of Applying Quantitative Risk Criteria in the Licensing of Nuclear Power Plants in the United States", Brookhaven National Laboratory, May 1981.
98. NUREG/CR-1930, BNL-NUREG-51339, B. Miller and R.E. Hall, "Index of Risk Exposure and Risk Acceptance Criteria", Brookhaven National Laboratory, February 1981.
99. NUREG/CR-2272, SAND81-7143, D.W. Cooper, et. al., "Expedient Methods of Respiratory Protection", Harvard School of Public Health, November 1981.
100. SAND78-0092, D.C. Aldrich, et. al., "A Model of Public Evacuation for Atmospheric Radiological Releases", Sandia Laboratories, June 1978.
101. Letter dated 9 April 1980 from Harold R. Denton to Cordell Reed and attachments.
102. NUREG/CR-2859, ANL-CT-81-32, C.A. Kot, et. al., "Evaluation of Aircraft Crash Hazards Analyses for Nuclear Power Plants", Argonne National Laboratories, June 1982.
103. NUREG/CR- BNL-NUREG-51322, R.E. Hall, et. al., "Sensitivity Risk Parameters to Human Errors in Reactor Safety Study for a PWR", Brookhaven National Laboratory, January 1981.
104. NUREG/CR-1278, A.D. Swain and H.E. Guttmann, "Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications", Draft Report for Interim Use and Comment, Sandia Laboratories, October 1980.
105. "Class 9" or beyond design basis accident consequence analyses for the following reactors from the indicated Environmental Impact Statements:  

Byron, NUREG-0848	Callaway, NUREG-0813
Catawba, NUREG-0921	Clinton, NUREG-0854
Commanche Peak, NUREG-0775	
Fermi, NUREG-0769	Grand Gulf, NUREG-0777
Midland, NUREG-0537	Palo Verde, NUREG-0841
Perry, NUREG-0884	San Onofre, NUREG-0490
Seabrook, NUREG-0895	St. Lucie, NUREG-0842
Summer, NUREG-0719	Susequehanna, NUREG-0564
Waterford, NUREG-0779	Wolf Creek, NUREG-0878
WNP-2, NUREG-0812	Shearon Harris, when published
Bellefonte, when published	
106. PASNY and Con Ed, IPPSS, March 1982.

Pursuant to discussion with NRC Staff counsel, this listing will be supplemented by 7 December 1982. Once UCS/NYPIRG receives the testimony from the Licensees and the Staff, it may be necessary to supplement this list, and it may be possible to delete references from this list; UCS/NYPIRG will promptly notify the NRC Staff of such changes.

Response to Interrogatory 2

NRC Staff interrogatory 2 states as follows:

"(a) Upon what person or persons do you rely to substantiate in whole or in part your case on Contentions 1.1 and 2.1?

(b) Provide the address and education and professional qualifications of any persons named in your response to 2a above.

(c) Identify which of the above persons or any other persons you may call as witnesses on these contentions referenced in 2a, above."

UCS/NYPIRG has not yet secured witnesses on Commission Questions 1 and 2. The NRC Staff will be notified within 48 hours of the time that any witnesses have been secured.

Response to Interrogatory 3

NRC Staff interrogatory 3 states as follows:

"Please provide the following information concerning the individuals in Interrogatory 2c. above:

(a) The subject matter of the individual's testimony; and

(b) Proceedings, if any, in which the individual has presented testimony on the same subject matter."

See response to Interrogatory 2, above.

Response to Interrogatory 4

NRC Staff interrogatory 4 states as follows:

"Pleasee define what you mean by the term "lead time" as used in your amended Contention I(B)(5). Please refer to Contention 1.1."

The phrase "lead time" is not used in UCS/NYPIRG Contention I(B)(5) as filed on 2 December 1981 or as adopted by the Board as Contention 1.1. As normally used by UCS/NYPIRG, however, lead time means the amount of time available between recognition of the need for implementation of protective actions as a result of an impending or actual release of radioactivity and the time at which consequences begin to accrue from such a release.

Response to Interrogatory 5

NRC Staff interrogatory 5 states as follows:

"Please define what you mean by the term "early deaths" as used in your amended Contention III(B). Please refer to Contention 1.1."

The phrase "early death" is not used in UCS/NYPIRG Contention III(B) as filed on 2 December 1981 or as adopted by the Board as Contention 1.1. As normally used by UCS/NYPIRG, early death is synonomous with early fatality, and refers to a fatality occurring within one year of a large release of radioactivity associated with a nuclear reactor accident.

Response to Interrogatory 6

NRC Staff interrogatory 6 states as follows:

"Please identify the preliminary studies which you contend in Basis 1 of your amended Contention III(B)

show that in the event of a radioactive release such as a PWR-2 release, with Class D stability, 4 meters/second wind and rain, persons downwind within 4 miles will receive a radiation dose in excess of 200 rems within three to five hours of the onset of accidental conditions. Identify all documents referenced or relied upon in response to this interrogatory."

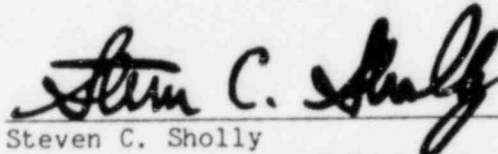
See "Direct Testimony of Brian Palenik and Dr. Jan Beyea", and references therein, in this proceeding.

Response to Document Requests

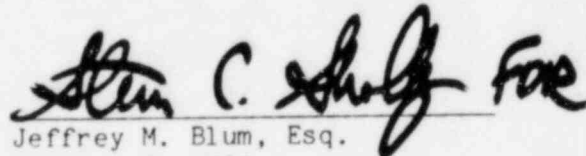
Documents cited herein will be made available for inspection and copying at your expense at UCS's office upon request.

DATED: 3 December 1982

RESPECTFULLY SUBMITTED,



Steven C. Sholly  
Union of Concerned Scientists  
1346 Connecticut Avenue, N.W.  
Suite 1101  
Washington, D.C. 20036



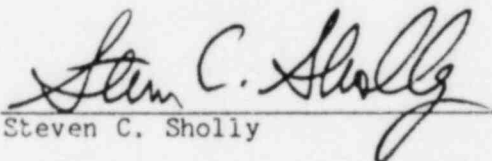
Jeffrey M. Blum, Esq.  
Counsel for UCS  
New York University Law School  
423 Vanderbilt Hall  
40 Washington Square South  
New York, NY 10012

VERIFICATION

DISTRICT OF COLUMBIA ) :S.:

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

That I am Technical Research Assistant for the Union of Concerned Scientists, a joint intervenor with the New York Public Interest Research Group, Inc., in the Indian Point Special Investigation being conducted for the U.S. Nuclear Regulatory Commission by the Atomic Safety and Licensing Board; 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  
3rd day of December, 1982

  
Notary Public

My Commission expires  
October 31, 1986