

March 9, 1983

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
CAROLINA POWER & LIGHT COMPANY)	
AND NORTH CAROLINA EASTERN)	Docket Nos. 50-400 OL
MUNICIPAL POWER AGENCY)	50-401 OL
)	
(Shearon Harris Nuclear Power)	
Plant, Units 1 and 2))	

APPLICANTS' INTERROGATORIES AND REQUEST
FOR PRODUCTION OF DOCUMENTS TO CANP
(FIRST SET)

Pursuant to 10 C.F.R. §§ 2.740b and 2.741 and to the Atomic Safety and Licensing Board's "Memorandum and Order (Reflecting Decisions Made Following Prehearing Conference)" of September 22, 1982, Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency hereby request that Citizens Against Nuclear Power ("CANP") answer separately and fully in writing, and under oath or affirmation, each of the following interrogatories, and produce and permit inspection and copying of the original or best copy of all documents identified in the responses to interrogatories below.

Under the Commission's Rules of Practice, answers or objections to these interrogatories must be served within 14

days after service of the interrogatories; responses or objections to the request for production of documents must be served within 30 days after service of the request.

These interrogatories are intended to be continuing in nature, and the answers should promptly be supplemented or amended as appropriate, pursuant to 10 C.F.R. § 2.740(e), should CANP or any individual acting on its behalf obtain any new or differing information responsive to these interrogatories. The request for production of documents is also continuing in nature and CANP must produce immediately any additional documents it, or any individual acting on its behalf, obtains which are responsive to the request, in accordance with the provisions of 10 C.F.R. § 2.740(e).

Where identification of a document is requested, briefly describe the document (e.g., book, letter, memorandum, transcript, report, handwritten notes, test data) and provide the following information as applicable: document name, title, number, author, date of publication and publisher, addressee, date written or approved, and the name and address of the person or persons having possession of the document. Also state the portion or portions of the document (whether section(s), chapter(s), or page(s)) upon which CANP relies.

Definitions: As used hereinafter, the following definitions shall apply:

"Applicants" is intended to encompass Carolina Power & Light Company, North Carolina Eastern Municipal Power Agency and their contractors for the Harris Plant.

"Document(s)" means all writings and records of every type in the possession, control or custody of CANP or any individual acting on its behalf, including, but not limited to, memoranda, correspondence, reports, surveys, tabulations, charts, books, pamphlets, photographs, maps, bulletins, minutes, notes, speeches, articles, transcripts, voice recordings and all other writings or recordings of any kind; "document(s)" shall also mean copies of documents even though the originals thereof are not in the possession, custody, or control of CANP. A document shall be deemed to be within the "control" of CANP or any individual acting on its behalf if it has ownership, possession or custody of the document or copy thereof, or has the right to secure the document or copy thereof, from any person or public or private entity having physical possession thereof.

The "ER" is the Environmental Report - Operating License Stage for the Shearon Harris Nuclear Power Plant, as amended.

"CANP Contention 5" consists of Joint Intervenors' Contention II and Intervenor Wells Eddleman's Contention 37(B). Specifically, CANP Contention 5(a)-(f) states:

The long term somatic and genetic health effects of radiation releases from the facility during normal operations, even where such releases are within existing guidelines, have been seriously underestimated for the following reasons:

(a) The work of Mancuso, Stewart, Kneale, Gofman and Morgan establish that the BEIR-III Report (1980 report of the National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation, entitled "The Effects on Populations of Exposure to Low-Levels of

Ionizing Radiation") (1) incorrectly understood the latency periods of cancer; (2) considered only expressed dominant genetic defects rather than recessive genetic defects; and (3) failed to use a supralinear response rather than a threshold or linear-or-less model to determine low-level radiation effects.

(b) Insufficient consideration has been given to the greater radiation effects resulting from internal-emitters due to incorrect modeling of internal absorption of radionuclides, and underestimation of the health and genetic effects of alpha, beta and neutron radiation on DNA, cell membranes and enzyme activity. (Reference: sources cited in Eddleman 37(F).)

(c) The work of Gofman and Caldicott shows that the NRC has erroneously estimated the health effects of low-level radiation by examining effects over an arbitrarily short period of time compared to the length of time the radionuclides actually will be causing health and genetic damage.

(d) Substantial increases in cancer mortality rates have been observed in the vicinity of nuclear facilities. Sternglass, "Cancer Mortality Changes Around Nuclear Facilities in Connecticut," February, 1978.

(e) The radionuclide concentration models used by Applicants and the NRC are inadequate because they underestimate or exclude the following means of concentrating radionuclides in the environment: rainout of radionuclides or hot spots; radionuclides absorbed in or attached to fly ash from coal plants which are in the air around the SHNPP site; and incomplete mixing and dispersion of radionuclides.

(f) In computing radionuclide concentrations in the environment, less reactive rather than more reactive forms

of radionuclides are used in the computation, and certain radionuclides are ignored. (Reference: sources cited in Eddleman 37(10)).

CANP Contention 5(g) states:

The work of I.D.J. Bross (Ph.D.), Rosalie Bertell (Ph.D.) and others shows that radiation exposure increases the risk not only of cancer but a host of other diseases, allergies, and causes of death including heart disease, heart attack, and others. The estimates of the numbers of such victims made by the preceding workers et al are more accurate than the estimates (if any) used by Applicants or NRC Staff or BEIR committee reports.

"CANP Contention 6" is identical to Eddleman Contention 29 & 30 and states:

Applicants have underestimated radioiodine releases during normal operations and have not demonstrated that normal radioiodine releases will not exceed Appendix I limitations.

The "Beir-III Report" is the 1980 report authored by the National Academy of Science's Committee on the Biological Effects of Ionizing Radiations entitled, "The Effects on Populations of Exposure to Low Levels of Ionizing Radiation."

GENERAL INTERROGATORIES

1(a). State the name, present or last known address, and present or last known employer of each person known to CANP to have first-hand knowledge of the facts alleged, and upon which CANP relied in formulating allegations in each of the contentions which are the subject of this set of interrogatories.

(b). Identify those facts concerning which each such person has first-hand knowledge.

(c). State the specific allegation in each contention which CANP contend such facts support.

2(a). State the name, present or last known address, and present or last employer of each person, other than affiant, who provided information upon which CANP relied in answering each interrogatory herein.

(b). Identify all such information which was provided by each such person and the specific interrogatory response in which such information is contained.

3(a). State the name, address, title, employer and educational and professional qualifications of each person CANP intends to call as an expert witness or a witness relating to any contention which is the subject of this set of interrogatories.

(b). Identify the contention, including its subpart, regarding which each such person is expected to testify.

(c). State the subject matter to which each such person is expected to testify.

4(a). Identify all documents in CANP's possession, custody or control, including all relevant page citations, pertaining to the subject matter of, and upon which CANP relied in formulating allegations in each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s) to which each such document relates.

(c). State the specific allegation in each contention which CANP contends each document supports.

5(a). Identify all documents in CANP's possession, custody or control, including all relevant page citations, upon which you relied in answering each interrogatory herein.

(b). Identify the specific interrogatory response(s) to which each such document relates.

6(a). Identify any other source of information, not previously identified in response to Interrogatory 2 or 5, which was used in answering the interrogatories set forth herein.

(b). Identify the specific interrogatory response(s) to which each such source of information relates.

7(a). Identify all documents which CANP intends to offer as exhibits during this proceeding to support the contentions which are the subject of this set of interrogatories or which CANP intends to use during cross-examination of witnesses presented by Applicants and/or the NRC Staff on each contention which is the subject of this set of interrogatories.

(b). Identify the contention(s), including subpart(s), to which each document relates and the particular page citations applicable to each contention.

INTERROGATORIES ON CANP CONTENTION 4
(DEFECTIVE HANGAR WELDS)

Interrogatories 4-1(a) through 4-5(e) all relate to Applicants' "Final Report, Weld Symbol Errors and Misapplication of Weld on Bergen-Patterson Pipe Hangers", and to NRC IE Inspection Report 50-4111 and to NRC IE Inspection Report 50-400/401/402/403-81-12, attached hereto.

4-1 (a). Do you contend that Applicants failed to take effective corrective action upon discovery of the pipe hangar welding deficiencies?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all the facts which support your allegation that Applicants failed to take effective corrective action upon discovery of the pipe hangar welding deficiencies.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 4.

4-2 (a). Do you contend that the additional welding and inspection training and instructions initiated by Applicants following discovery of the pipe hangar welding deficiencies was or will be ineffective in preventing subsequent occurrences of similar deficiencies?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 4.

4-3 (a). Do you contend that the weld rework/repair efforts undertaken by Applicants were inadequate in restoring the welds to an acceptable condition?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 4.

4-4 (a). Do you contend that Applicants improperly accepted any welds without requiring rework, i.e., accepted in the "as-is" condition?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 4.

4-5 (a). Do you contend that the NRC Staff improperly closed out the infraction involving the pipe hangar welding deficiencies by accepting Applicants' corrective action?

(b). If the answer to the preceding interrogatory is affirmative, state in detail all facts which support this allegation.

(c). If the answer to (a) above is other than affirmative, explain in detail how your response is consistent with the allegations set forth in Contention 4.

INTERROGATORIES ON CANP CONTENTION 5
(HEALTH EFFECTS)

5-1. Specify the long-term somatic and genetic health effects caused by radiation released from the Shearon Harris facility during normal operation which you believe have been seriously underestimated.

5-2 (a). State what you believe would be a correct estimation of the long-term somatic and genetic health effects of radiation released from the Shearon Harris facility during normal operation.

(b). Provide the analytical basis for your answer to Interrogatory 5-2(a).

5-3. Define "latency periods," as that term is used in Contention 5(a)(1).

5-4. Explain in what way the Beir-III Report incorrectly understood the latency periods for cancer.

5-5. Explain your view of the correct understanding of cancer latency periods.

5-6. Does your latency period theory apply to all forms of cancer? If not, please specify the applicable cancers.

5-7. Define "expressed dominant genetic defects," as that term is used in Contention 5(a)(2).

5-8. Define "recessive genetic defects," as that term is used in Contention 5(a)(2).

5-9. Explain how you would take recessive genetic effects into account in estimating long-term somatic health effects of low levels of radiation.

5-10. Explain how you would take recessive genetic effects into account in estimating long-term genetic health effects of low levels of radiation.

5-11. Describe how the consideration of recessive genetic defects would change the Beir-III Report's estimation of somatic health effects.

5-12 (a). Provide what is in your view the correct estimate of somatic health effects of low levels of radiation, taking recessive genetic defects into consideration.

(b). Provide the analytical basis for your answer to Interrogatory 5-12(a).

5-13. Describe how the consideration of recessive genetic defects would change the Beir-III Report's estimation of genetic health effects.

5-14 (a). Provide what is in your view the correct estimate of genetic health effects caused by low-level radiation.

(b). Provide the analytical basis for your answer to Interrogatory 5-14(a).

5-15. Define "supra-linear response model," as that term is used in Contention 5(a)(3).

5-16. Define "threshold model," as that term is used in Contention 5(a)(3).

5-17. Define "linear-or-less model," as that term is used in Contention 5(a)(3).

5-18. Explain why it was incorrect for the Beir-III Report to not use a supra-linear response model to determine low-level radiation effects.

5-19. Specify how use of a supra-linear response model would change the low-level radiation effects found in the Beir-III Report.

5-20. Specify the greater radiation effects resulting from internal emitters referred to in Contention 5(b).

5-21. How and by whom has the internal absorption of radionuclides been incorrectly modeled?

5-22. Explain why, in your view, the health and genetic effects of alpha, beta and neutron radiation on DNA, cell membranes and enzyme activities have been underestimated.

5-23. Specify the extent to which the health and genetic effects of alpha, beta and neutron radiation on DNA, cell membranes and enzyme activities have been underestimated.

5-24. Explain the significance of the underestimation of the health and genetic effects of alpha, beta and neutron radiation on (a) DNA, (b) cell membranes, and (c) enzyme activities.

5-25. Identify the documents or other representations by the NRC of which you are critical in Contention 5(c).

5-26. What constitutes an "arbitrarily short period of time" over which to examine health effects for purposes of estimating the effects of low-level radiation?

5-27. Explain the basis for your answer to Interrogatory 5-26.

5-28. What constitutes a minimally acceptable period of time in which to examine health effects for purposes of estimating the effects of low-level radiation?

5-29. Explain the basis for your answer to Interrogatory 5-28.

5-30. Define "substantial increases in cancer mortality rates," as that phrase is used in Contention 5(d).

5-31. Identify the specific nuclear facilities to which you are referring in Contention 5(d).

5-32. Who has observed substantial increases in cancer mortality rates in the vicinity of nuclear facilities?

5-33. Identify the radionuclide concentration models used by Applicants and the NRC to which you refer in Contention 5(e).

5-34. Describe the phenomenon "rainout of radionuclides or hot spots" to which you refer in Contention 5(e).

5-35. Specify the extent to which the radionuclide concentration models to which you refer in Contention 5(e) are underestimated because they exclude consideration of rainout of radionuclides or hot spots.

5-36. How should radionuclide concentration models take into account rainout of radionuclides or hot spots?

5-37. Describe the phenomenon whereby radionuclides are absorbed in fly ash from coal plants.

5-38. Describe the phenomenon whereby radionuclides are attached to fly ash from coal plants.

5-39. Identify the specific coal plants to which you are referring in Contention 5(e).

5-40. Specify the extent to which the radionuclide concentration models to which you refer in Contention 5(e) are underestimated because they exclude consideration of (a) radionuclides absorbed in fly ash from coal plants; and (b) radionuclides attached to fly ash from coal plants.

5-41. How should radionuclide concentration models take into account (a) radionuclides absorbed in fly ash from coal plants, and (b) radionuclides attached to fly ash from coal plants?

5-42. Describe the phenomenon "incomplete mixing and dispersion of radionuclides."

5-43. What causes incomplete mixing and dispersion of radionuclides?

5-44. How should radionuclide concentration models take into account incomplete mixing and dispersion of radionuclides?

5-45. Specify the extent to which the radionuclide concentration models to which you refer in Contention 5(e) are underestimated because they exclude consideration of incomplete mixing and dispersion of radionuclides.

5-46. Identify the radionuclide concentration computation to which you refer in Contention 5(f).

5-47. Specify all of the less reactive forms of radionuclides which you believe are used in the computation to which you refer in Contention 5(f).

5-48. For each of the less reactive forms of radionuclides listed in your answer in Interrogatory 5-47, specify the more reactive form(s) of radionuclides which you believe should be used in the computation.

5-49. Describe the impact on the radionuclide concentration computation to which you refer in Contention 5(f) of exclusion of each of the more reactive chemical form(s) of radionuclides listed in your answer to Interrogatory 5-48.

5-50. Identify all of the radionuclides to which you refer in Contention 5(f) which are ignored in computing radionuclide concentrations in the environment.

5-51. Identify all of the diseases with which you are concerned in Contention 5(g).

5-52. What levels of radiation exposure would increase the risk of diseases identified in response to Interrogatory 5-51?

5-53. For each of the diseases identified in response to Interrogatory 5-51, identify the increased risk which you believe would be caused by the level(s) of radiation exposure identified in response to Interrogatory 5-51.

5-54. In Contention 5(g), are you challenging radiation risk estimates used in the BEIR-III Report, or used by Applicants or the NRC Staff?

5-55. If you are challenging radiation risk estimates used in the BEIR-III Report or used by Applicants or the NRC Staff, identify the specific radiation risk estimate(s) which you are challenging.

5-56. Define "victim" as you use the word in Contention 5(g).

5-57. Specify what you believe would be an accurate estimate of the number of victims of each of the diseases you identified in response to Interrogatory 5-51 caused by the increased risk of radiation exposure with which you are concerned.

INTERROGATORIES ON CANP 6
(NORMAL RADIOIODINE RELEASES)

6-1. Identify the documents in which Applicants have underestimated radioiodine releases during normal operations.

6-2. Specify the extent to which Applicants have underestimated radioiodine releases during normal operations.

6-3. Provide the analytical basis for your answer to Interrogatory 6-2.

6-4. Are you challenging the radioiodine concentration levels (airborne, on the ground or in vegetation) provided in Table 5.5.2-2 of the ER?

6-5. If the answer to Interrogatory 6-4 is yes, provide the analytical basis for your view.

6-6 (a). Are you challenging the meteorological data used to calculate the concentrations of radioiodines provided in Table 5.2.2-2?

(b). If the answer to 6-6(a) is yes, specify the meteorological data which you are challenging.

(c). If the answer to Interrogatory 6-6(a) is yes, explain the basis for your disagreement(s) with Applicants about the meteorological data used to calculate the concentrations of radioiodines presented in Table 5.2.2-2.

6-7 (a). Are you challenging the source terms used by Applicants to calculate the concentrations of radioiodines presented in Table 5.2.2-2?

(b). If the answer to Interrogatory 6-7 is yes, identify the specific source term(s) which you are challenging

because they result in an underestimation of concentrations of radioiodines at the site boundary during normal plant operations.

(c). If the answer to Interrogatory 6-7(a) is yes, provide the analytical basis for your challenge to the source term(s) identified in your response to Interrogatory 6-7(b).

6-8. Are you challenging the expected concentrations of radioiodines in the cooling tower blowdown and the Main Reservoir presented in (a) Table 5.2.2-3a of the ER, or (b) Table 5.2.2-3b of the ER?

6-9. If the answer to Interrogatory 6-8(a) or (b) is yes, provide the analytical bases for your view.

6-10 (a). Do you challenge Applicants' use of NRC Regulatory Guide 1.113 to calculate concentrations of radionuclides in the Main Reservoir?

(b). If the answer to Interrogatory 6-10(a) is yes, provide the analytical basis for your view.

(c). If the answer to Interrogatory 6-10(a) is yes, explain how you would change the dispersion model in question or otherwise calculate radionuclide concentrations in the Main Reservoir.

6-11 (a). Identify any other disagreements you have with either the assumptions or the analyses used by Applicants in Section 5.2.2 of the ER which relate to Contention 6.

(b). Provide the analytical basis for your answer(s) to Interrogatory 6-11(a).

6-12 (a). Identify any disagreements you have with either the assumptions or the analyses used by Applicants in Section 5.2.4 of the ER to calculate the maximum individual doses from all pathways of radiation exposure, including from radioiodine in the various exposure pathways.

(b). Provide the analytical basis for your answer(s) to Interrogatory 6(a).

6-13 (a). Do you disagree with any of the doses provided in Table 5.2.5-1 of the ER because they underestimate radioiodine doses?

(b). If the answer to Interrogatory 6-13(a) is yes, provide the analytical basis for your view.

6-14 (a). Do you believe that any of the calculated individual doses from the Shearon Harris facility provided in Table 5.2.5-2 of the ER underestimate radioiodine releases?

(b). If the answer to Interrogatory 6-14(a) is yes, provide the analytical bases for each underestimated dose which you believe is provided in Table 5.2.5-2.

6-15 (a). Do you disagree with the use of the Appendix I exposure guidelines used in Table 5.2.5-2?

(b). If the answer to Interrogatory 6-15(a) is yes, explain the basis for your answer.

6-16. Explain in detail what you mean when you state that Applicants "have not demonstrated that normal radioiodine releases will not exceed Appendix I limitations."

6-17. Describe the demonstration that you believe to be necessary in order for Applicants to establish that normal radioiodine releases will not exceed Appendix I limitations.

REQUEST FOR PRODUCTION OF DOCUMENTS

Applicants request that CANP respond in writing to this request for production of documents and produce the original or best copy of each of the documents identified or described in the answers to each of the above interrogatories at a place mutually convenient to the parties.

Respectfully submitted,

Deborah B. Bauser

Thomas A. Baxter, P.C.
Deborah B. Bauser

SHAW, PITTMAN, POTTS & TROWBRIDGE
1800 M Street, N.W.
Washington, D.C. 20036
(202) 822-1000

Richard E. Jones
Samantha Francis Flynn
CAROLINA POWER & LIGHT COMPANY
P.O. Box 1551
Raleigh, North Carolina 26602
(919) 836-7707

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