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April 15, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:
Marshall E. Miller, Chairman
Gustave A. Linenberger, Jr.
Dr. Cadet H. Hand, Jr.



In the Matter of

UNITED STATES DEPARTMENT OF ENERGY
PROJECT MANAGEMENT CORPORATION
TENNESSEE VALLEY AUTHORITY

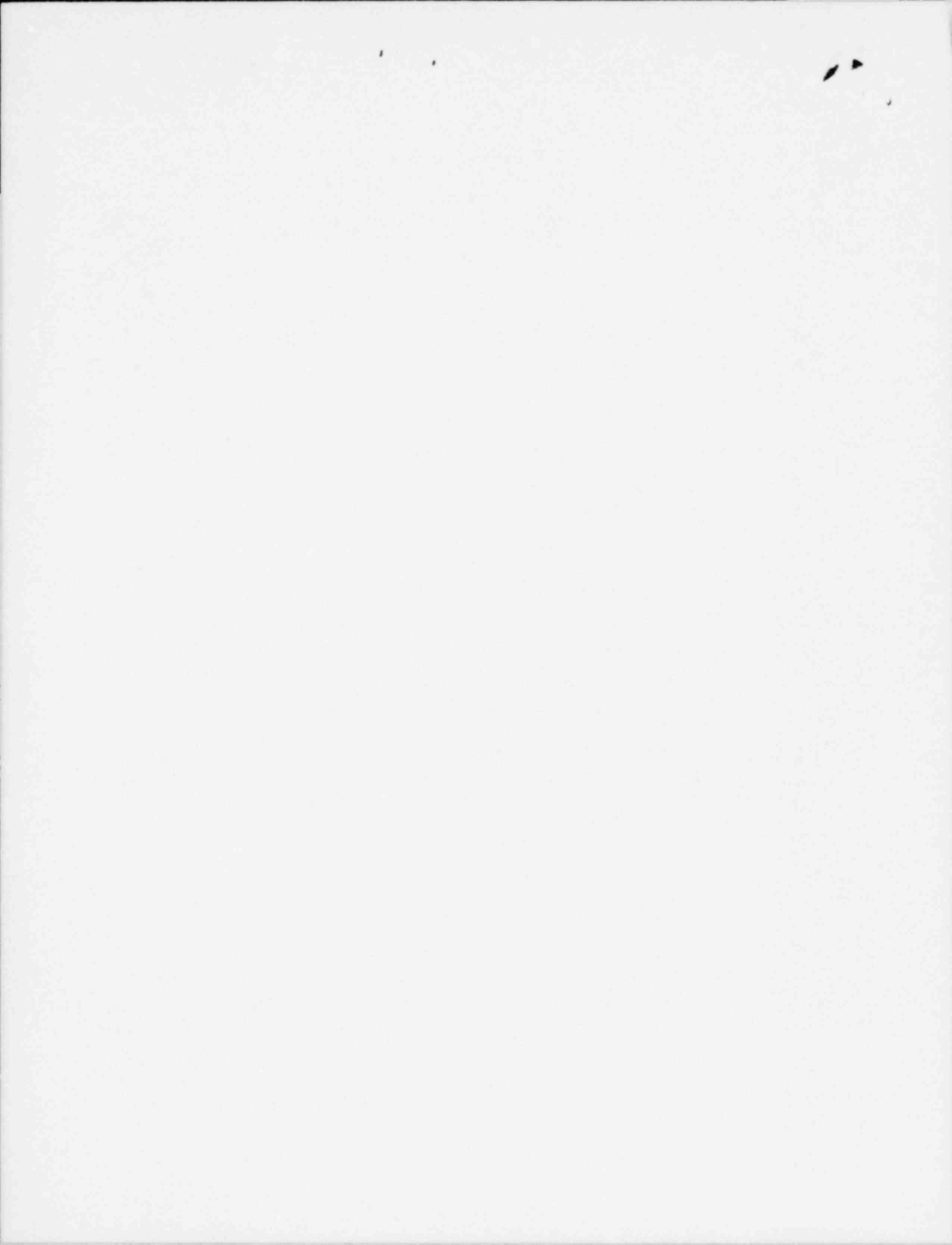
(Clinch River Breeder Reactor Plant)

Docket No. 50-537

NATURAL RESOURCES DEFENSE COUNCIL, INC.
AND THE SIERRA CLUB TWENTY-FOURTH
SET OF INTERROGATORIES AND
REQUEST TO PRODUCE TO STAFF

Pursuant to 10 CFR § 2.740b, and in accordance with the Board's Prehearing Conference Order of February 11, 1982, Intervenor, Natural Resources Defense Council, Inc. and the Sierra Club, request that the attached interrogatories be answered fully, in writing and under oath, by one or more officers or employees of Staff who has personal knowledge thereof or is the closest to having personal knowledge thereof. If the interrogatories are answered by more than one person, whether or not he or she verified the answers, and

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- (e) Explain whether Staff is presently engaged in or intends to engage in any further, ongoing research program which may affect Staff's answer. This answer need be provided only in cases where Staff intends to rely upon ongoing research not included in Section 1.5 of the PSAR at the LWA or construction permit hearing on the CRBR. Failure to provide such an answer means that Staff does not intend to rely upon the existence of any such research at the LWA or construction permit hearing on the CRBR.
- (f) Identify the expert(s) if any, which Staff intends to have testify on the subject matter questioned, and state the qualifications of each such expert. This answer may be provided for each separate question or for a group of related questions. This answer need not be provided until Staff has in fact identified the expert(s) in question or determined that no expert will testify, as long as such answer provides reasonable notice to Intervenor.

In identifying documents which serve as a basis for or pertain to any answer, Staff should treat certain interrogatories, where so stated, as a request, pursuant to 10 CFR § 2.741, that Staff produce and permit Intervenor to inspect and copy such documents at such time and in such manner as may be agreed upon by the parties.

Definitions

As used in these Interrogatories, the following terms shall have the following meanings:

- A. "CRBR" means the Clinch River Breeder Reactor.
- B. "Document" means any papers, photographs, criteria, standards of review, recordings, memoranda, books, records, writings, letters, telegrams, mailgrams, correspondence, notes and minutes of meetings or of conversations or of phone calls, interoffice, intra-agency or interagency memoranda or written communications of any nature, recordings of conversations either in writing or upon any mechanical or electronic or electrical recording devices, notes, exhibits, appraisals, work papers, reports, studies, opinions, surveys, evaluations, projections, hypotheses, formulas, designs, drawings, manuals, notebooks, worksheets, contracts, agreements, letter agreements, diaries, desk calendars, charts, schedules, appointment books, punchcards and computer printout sheets, computer data, telecopier transmissions, directives, proposals, and all drafts, revisions, and differing versions (whether formal or informal) of any of the foregoing, and also all copies of any of the foregoing which differ in any way (including handwritten notations or other written or printed matter of any nature) from the original.

C. "DOE" means the Department of Energy and its predecessor agencies.

D. "Identify" means"

1. With respect to a natural person, his name, address, title, and job description;
2. With respect to a governmental agency, bureau, department, division, interdepartmental committee, advisory committee, or working group, formal or informal, its proper designation and location;
3. With respect to a corporation, partnership or other legal entity, its name, principal place of business, and nature of its business;
4. With respect to a document, the type of document (e.g., regulation, manual, directive, letter, memorandum, list, study, report, etc.), date, the name of the person who prepared the document, the name of the person for whom the document was prepared or to whom it was delivered, and the name, address, and title of the person who presently has possession or control of the document; and
5. With respect to a communication other than a document, the type of communication (e.g., telephone, in-person, etc.), date, participants,

and any notes, memoranda, records of conversations, diary or calendar entries or other document or notations memorializing such communication.

- E. "NRC" means the United States Nuclear Regulatory Commission.
- F. "CDA" means core disruptive accident.

I. Contentions 1, 2, and 3

1. Has Staff attempted to identify and analyze the ways in which human error can:

- a. initiate CRBR accidents?
- b. exacerbate CRBR accidents?
- c. interfere with the mitigation of CRBR accidents?

If the answer to any part of the above interrogatory is yes, identify and provide all such analyses and any and all documents related thereto in the possession of Staff, including draft analyses and inputs to such analyses.

2. Are any analyses of the type identified in Question 1 currently being prepared by Staff or its contractors?

If the answer to this interrogatory is yes, identify and provide all such analyses and any and all documents related thereto in the possession of Staff, including drafts and inputs to such analyses.

3. Is human error a significant contributor to the overall risk of accidents in:

- a. the CRBR?
- b. LMFBRs?
- c. LWRs?

4. Is there any difference in the role human error plays in contributing to overall accident risk between:

- a. the CRBR and LWRs?
- b. LMFBRs and LWRs?

If the answer to any part of this interrogatory is yes, explain each and every difference and the reason(s) for such difference.

5. Has Staff's position regarding the significance of human error as a contributor to the overall risk of accidents for any reactor type changed since TMI? If the answer to this interrogatory is yes:
 - a. explain in detail how Staff's position has changed;
 - b. identify and provide any and all documents in the possession of Staff related to Staff's position.
6. If Staff agrees with the statement in the Report of the Reactor Safety Research Review Group (September 1981) that most studies of the likely causes of serious accidents conclude through probabilistic risk analysis that over 50% of the risk is associated with human failure to perform as intended, then
 - a. identify and provide all documents in the possession of Staff relating to this issue;
 - b. explain whether Staff believes the same conclusion should apply to the CRBR, namely that there is a 50% chance that any serious accidents would be associated with human error;
 - c. if Staff disagrees with the above Review Group statement, explain in detail why Staff does not agree.

7. Does Staff have any quantitative probabilistic analysis upon which it relies to distinguish accidents within the design basis from those accidents beyond the design basis? If the answer to this interrogatory is yes, identify and provide all such analyses in the possession of Staff and any and all documents related thereto.
8. Has Staff conducted its own probabilistic risk assessment for the CRBR? If so, identify and provide such assessment and any and all documents related thereto in the possession of Staff. If not, explain in detail whether Staff intends to conduct such an assessment, and indicate the licensing stage for which Staff intends to complete such analysis.
9. Identify precisely each section and subsection of Applicants' PSAR:
 - a. which Staff believes it must review for the LWA-1 proceeding;
 - b. upon which Staff intends to rely in making the required LWA-1 findings;
 - c. upon which Staff intends to rely in responding to Intervenor's Contentions 1, 2, and 3;
 - d. upon which Staff relied in setting forth the Staff position in the May 6, 1976 letter from Denise to Caffey;

- e. which Staff believes it must review for the CP stage;
- f. upon which Staff intends to rely in making the required CP findings.

In answering the above questions, indicate precisely whether Staff intends to review or rely upon to any degree whatsoever the following PSAR sections in making its LWA-1 findings:

- i. PSAR Appendix C, "Reliability Program;"
- ii. PSAR Chapter 7, "Instrumentation and Controls;"
- iii. PSAR Section 4.4, "Thermal and Hydraulic Design;"
- iv. PSAR Chapter 5, "Heat Transport and Connector Systems."

For each PSAR section and subsection identified in response to this interrogatory, explain in detail the level of review of and reliance upon such section or subsection Staff believes is necessary for the LWA-1 proceeding, and explain why such a level of review and reliance was selected.

- 10. Describe in detail the extent of Staff's review to date of matters contained in the PSAR which Staff feels are outside the scope of the LWA-1 proceeding.

- a. Does Staff believe that any of these matters have any bearing whatsoever on the issuance of an LWA-1? If the answer is yes, identify each such matter and explain in detail the extent of its impact on the LWA-1 proceeding.
 - b. Explain how these matters will be considered at the CP stage.
11. Identify precisely each section and subsection of Applicants' "CRBRP Safety Study: An Assessment of Accident Risks in the CRBRP" (CRBRP-1) (March 1977):
 - a. which Staff believes it must review for the LWA-1 proceeding;
 - b. upon which Staff intends to rely in making the required LWA-1 findings;
 - c. upon which Staff intends to rely in responding to Intervenor's Contentions 1, 2, and 3;
 - d. which Staff must review at the CP stage;
 - e. which Staff will review at the CP stage.

For each CRBRP-1 section and subsection identified in response to this interrogatory, explain in detail the level of review of and reliance upon such section or subsection Staff believes is necessary for the LWA-1 proceeding, and explain why such a level of review and reliance was selected.

12. Describe in detail the extent of Staff's review to date of matters contained in the CRBRP-1 which Staff feels are outside the scope of the LWA-1 proceeding.
 - a. Does Staff believe that any of these matters have any bearing whatsoever on the issuance of an LWA-1? If the answer is yes, identify such matter and explain in detail the extent of its impact on the LWA-1 proceeding.
 - b. Explain how these matters will be considered at the CP stage.
13. Identify precisely each section and subsection of Applicants' "Hypothetical Core Disruptive Accident Considerations in CRBRP" (CRBRP-3) (latest revision):
 - a. which Staff believes it must review for the LWA-1 proceeding;
 - b. upon which Staff intends to rely in making the required LWA-1 findings;
 - c. upon which Staff intends to rely in responding to Intervenor's Contentions 1, 2, and 3;
 - d. which Staff must review at the CP stage;
 - e. which Staff will review at the CP stage.

For each CRBRP-3 section and subsection identified in response to this interrogatory, explain in detail the level of review of and reliance upon such section or subsection Staff believes is necessary for the LWA-1

proceeding, and explain why such a level of review and reliance was selected.

14. Describe in detail the extent of Staff's review to date of matters contained in the CRBRP-3 which Staff feels are outside the scope of the LWA-1 proceeding.
 - a. Does Staff believe that any of these matters have any bearing whatsoever on the issuance of an LWA-1? If the answer is yes, identify such matter and explain in detail the extent of its impact on the LWA-1 proceeding.
 - b. Explain how these matters will be considered at the CP stage.
15. Identify precisely each section and subsection of General Electric's "An Assessment of HCDA Energetics in the CRBR Heterogeneous Reactor Core" (CRBRP-GEFR-00523) (Dec. 1981):
 - a. which Staff believes it must review for the LWA-1 proceeding;
 - b. upon which Staff intends to rely in making the required LWA-1 findings;
 - c. upon which Staff intends to rely in responding to Intervenor's Contentions 1, 2, and 3;
 - d. which Staff must review at the CP stage;
 - e. which Staff will review at the CP stage.

For each CRBRP-GEFR-00523 section and subsection identified in response to this interrogatory, explain in detail the level of review of and reliance upon such section or subsection Staff believes is necessary for the LWA-1 proceeding, and explain why such a level of review and reliance was selected.

16. Describe in detail the extent of Staff's review to date of matters contained in the CRBRP-GEFR-00523 which Staff feels are outside the scope of the LWA-1 proceeding.
 - a. Does Staff believe that any of these matters have any bearing whatsoever on the issuance of an LWA-1? If the answer is yes, identify such matter and explain in detail the extent of its impact on the LWA-1 proceeding.
 - b. Explain how these matters will be considered at the CP stage.
17. Identify precisely any other Applicant document, such as WARD-D-0118, Rev. 1, "CRBRP Nuclear Island Reliability Assessment of CRBRP Shutdown System" (Nov. 1975), and NEDM-14082, "An Update of the Preliminary Reliability Prediction for CRBRP Shutdown Heat Removal System," General Electric Co. (Jan. 1976):
 - a. which Staff believes it must review for the LWA-1 proceeding;

- b. upon which Staff intends to rely in making the required LWA-1 findings;
- c. upon which Staff intends to rely in responding to Intervenor's Contentions 1, 2, and 3;
- d. which Staff must review at the CP stage;
- e. which Staff will review at the CP stage.

For each document identified in response to this interrogatory, explain in detail the level of review of and reliance upon such document Staff believes is necessary for the LWA-1 proceeding, and explain why such a level of review and reliance was selected.

18. Describe in detail the extent of Staff's review to date of matters contained in the above document which Staff feels are outside the scope of the LWA-1 proceeding.
 - a. Does Staff believe that any of these matters have any bearing whatsoever on the issuance of an LWA-1? If the answer is yes, identify such matter and explain in detail the extent of its impact on the LWA-1 proceeding.
 - b. Explain how these matters will be considered at the CP stage.
19. Identify precisely each document, assertion of Applicants, test result, reliability program result, engineering judgement, historical experience, Staff

conclusion, and other factor or element of proof which Staff currently believes is necessary and upon which Staff currently intends to rely in making the following findings for an LWA-1:

- a. whether the requirements of section 102(2)(A), (C), and (E) of the National Environmental Policy Act have been complied with in this proceeding;
- b. the nature of the final balance among conflicting factors contained in the record of the proceeding;
- c. the result of weighing the environmental, economic, technical, and other benefits against environmental costs, and considering available alternatives;
- d. whether there is a reasonable assurance that the proposed site is a suitable location for a reactor of the general size and type proposed from the standpoint of radiological health and safety considerations under the Act and rules and regulations promulgated by the Commission pursuant thereto.

State whether this position is a final position.

20. Is it the Staff position that the analyses mandated under Part 100 must be done with finality at the LWA-1 stage for CRBR? If not, explain how Part 100 issues will be considered or reconsidered at the construction

permit stage? What information data or analyses not considered or reviewed for an LWA-1 will be considered or reviewed at the construction permit stage?

21. Will the analyses of CDAs and their consequences be reconsidered by the Staff at the construction permit stage? What information data or analyses relevant to CDAs and their consequences not considered for an LWA-1 will be considered or reviewed at the construction permit stage?
22. Is it the Staff position that the question of whether CDAs should be included within the design basis will be reconsidered at the construction permit stage?
23. If the answer to the question above is "yes," describe what information, data, analyses, evaluations, regulations, regulatory positions, etc., not considered or reviewed for the LWA-1 will be considered or reviewed prior to issuance of a construction permit.
24. What changes in design or siting will have to be made for the CRBR if a CDA is determined to be within the design basis? What will such changes cost? How much time would they take to accomplish?
25. Explain in detail why Staff believes that resolution of the following sections of Intervenor's contentions is not necessary for an LWA-1 decision:

- a. 1(b);
 - b. 2(d);
 - c. 2(f);
 - d. 2(g);
 - e. 2(h);
 - f. 3(a);
 - g. 3(d);
 - h. other (specify).
26. Is it Staff's position that the CRBR safety design criteria must be set to ensure that the radiological risks from the CRBR are comparable to those from a conventional light water reactor irrespective of whether the radiological risks from the CRBR can be further reduced? Explain in detail the basis for your answer.
27. In light of the fact that the "Standard Format and Content" (Feb. 1974) was a preliminary document on which further work was dropped, what is the basis for believing that the 67 events identified in the "Standard Format and Content" document encompass all credible events that should be considered in establishing the design basis of the CRBR?
28. Identify and provide all systems interaction studies relied upon by Staff to ensure that the CRBR design is adequate to cope safely with potential accidents involving human error and multiple system failures.

29. Since the TMI-2 accident, what specific changes (significant from a safety standpoint) have been made, and what additional changes must be made in the design of the CRBRP to cope with potential interaction accidents involving human error and multiple system failures?
30. Since the TMI-2 accident, what specific changes (significant from a safety standpoint) have been made, and what additional specific changes must be made in the regulations and other criteria used to judge the adequacy of the CRBRP design and the suitability of the CRBR site in light of the lessons learned from the TMI-2 accident and subsequent safety analyses?
31. How does Staff define "any accident considered credible" (see 10 CFR 100.11 at n.1) for a reactor of the general size and type as that proposed by Applicants (i.e., the CRBR)?
32. Explain in detail how the Staff has considered and implemented each portion of the Commission's January 18, 1979 policy statement regarding WASH-1400 in each aspect of the CRBR licensing process, including but not limited to:
- a. the analysis of Class 9 accidents in the FES;
 - b. the updating of Staff's answers to Intervenors' 11th Set of Interrogatories;

- c. the Staff safety objective that there be no greater than one chance in one million per year for potential consequences greater than the 10 CFR 100 dose guidelines for an individual plant;
 - d. the Staff position that the CRBR should include protection against meltdown phenomena and consequences which could lead to loss of containment system integrity within 24 hours.
33. Has Staff performed any analyses of Applicants' CRBRP Safety Study: An Assessment of Accident Risks in the CRBRP, (CRBRP-1) (March 1977)? If the answer to this interrogatory is yes, identify and produce such analyses and any and all documents in the possession of the Staff relating thereto.
34. If the answer to the above interrogatory is yes, explain in detail whether and for what reason(s) Staff concurs with or rejects Applicants' Study, or any part(s) thereof. If Staff concurs with or rejects any part of Applicants' Study, indicate such part(s) with specificity.
35. If Staff has not performed any analyses of Applicants' CRBRP Safety Study, explain in detail the reason(s) for Staff's inaction.

36. Has Staff performed any assessments (since April 25, 1977) of the adequacy of Applicants' proposed dual containment system? If the answer to the above interrogatory is yes:
- a. identify the person(s) who performed the review;
 - b. provide the date(s) during and upon which such review was performed and completed;
 - c. identify and produce all such assessments and any and all documents in the possession of Staff relating thereto, including all final and draft inputs to Staff's Safety Evaluation Report.
37. Has Staff performed any assessments (since April 25, 1977) of the adequacy of Applicants' proposed two independent reactor shutdown systems? If the answer to the above interrogatory is yes:
- a. identify the person(s) who performed the review;
 - b. provide the date(s) during and upon which such review was performed and completed;
 - c. identify and produce all such assessments and any and all documents in the possession of Staff relating thereto, including all final and draft inputs to Staff's Safety Evaluation Report.
38. Has Staff performed any assessments (since April 25, 1977) of the adequacy of Applicants' proposed two independent decay heat removal systems? If the answer to the above interrogatory is yes:

- c. identify the person(s) who performed the review;
 - b. provide the date(s) during and upon which such review was performed and completed;
 - c. identify and produce all such assessments and any and all documents in the possession of Staff relating thereto, including all final and draft inputs to Staff's Safety Evaluation Report.
39. Has Staff performed any assessments (since April 25, 1977) of the adequacy of Applicants' proposed means to detect subassembly faults, cope with these faults, and protect against progressive subassembly fault propagation? If the answer to the above interrogatory is yes:
- a. identify the person(s) who performed the review;
 - b. provide the date(s) during and upon which such review was performed and completed;
 - c. identify and produce all such assessments and any and all documents in the possession of Staff relating thereto, including all final and draft inputs to Staff's Safety Evaluation Report.
40. Has Staff performed any assessments (since April 25, 1977) of the adequacy of Applicants' proposed means for insuring heat transport system integrity, including systems for leak detection, provisions for

pre-service and in-service inspection, and long-term materials monitoring? If the answer to the above interrogatory is yes:

- a. identify the person(s) who performed the review;
- b. provide the date(s) during and upon which such review was performed and completed;
- c. identify and produce all such assessments and any and all documents in the possession of Staff relating thereto, including all final and draft inputs to Staff's Safety Evaluation Report.

41. Has Staff performed any assessments (since April 25, 1977) of the adequacy of Applicants' proposed means for protecting the containment system from the effects of sodium releases in the equipment cells, particularly those cells containing the main heat transport system equipment? If the answer to the above interrogatory is yes:

- a. identify the person(s) who performed the review;
- b. provide the date(s) during and upon which such review was performed and completed;
- c. identify and produce all such assessments and any and all documents in the possession of Staff relating thereto, including all final and draft inputs to Staff's Safety Evaluation Report.

42. The May, 6, 1976 letter from Richard P. Denise to Lochlin W. Caffey states on page 6 that "The accident consequences noted above are based on a spectrum of calculations performed by the NRC Staff for accident scenarios which included initiators such as reactivity additions ranging from a few cents to a few dollars per second, step reactivity insertions, loss of coolant flow, loss of heat sink, and fuel failure propagation."
- a. Identify and provide all such calculations and any and all documents in the possession of Staff related thereto.
 - b. Identify and provide all calculations of those and similar accident scenarios performed by Staff since April 25, 1977, and any and all documents in the possession of Staff related thereto.
43. Page 5 of the May 6, 1976 letter from Denise to Caffey states that the Staff "will require that the containment integrity will be provided for at least 24 hours following a postulated core disruptive accident."
- a. Describe in detail and provide justification for the Staff's requirements for maintenance of containment integrity following accidents in BWRs.
 - b. Describe in detail and provide justification for the Staff's requirements for maintenance of containment integrity following accidents in PWRs.

- c. Identify and provide any and all documents issued since April 25, 1977 in the possession of Staff relating to selection of the 24-hour criteria. For each document, indicate which portion(s), analyses, and reasoning specifically support selection of the 24-hour criterion.
 - d. Explain in detail the extent to which this requirement was based on the Staff's objective of assuring the comparability of CRBR safety to LWR safety, irrespective of whether the radioactive releases from the CRBR can be further reduced.
44. To the extent that it is necessary to identify all possible operator errors, off-normal operations, and component malfunctions in order to determine whether there is a large tolerance for such events in the CRBR, provide the identified operator errors, off-normal errors and component malfunctions for which large tolerances are provided in the CRBR design and explain the basis for the conclusion that a tolerance exists and it is large.^{1/}

^{1/} Intervenors repeat this Question, already in Intervenors' 11th Set of Interrogatories to Staff, to emphasize the need for an updated answer by April 30, 1982. Staff need answer this question only once, whether in response to this interrogatory or in updating answers to the 11th Set of Interrogatories to Staff.

45. Describe in detail the extent to which each of the Staff's conclusions in the May 6, 1976 Denise-Caffey letter have been affected by:
 - a. the shift to a heterogeneous CRBR core design;
 - b. changes in the design of the CRBR reactor internals;
 - c. lessons learned from TMI;
 - d. any new NRC regulations, Regulatory Guides or changes in policy.
46. Describe in detail Staff's current position on whether the CRBRP, as currently designed, will meet the Staff's safety objective that there be no greater than one chance in one million per year for potential consequences greater than the 10 CFR 100 dose guidelines for an individual plant and indicate whether such position is a final position. Identify and provide any and all documents in Staff's possession relating to such Staff position.
47. The May 6, 1976 Denise-Caffey letter states that "the numerical evaluation of system reliability and accident risks undertaken by the CRBR Project and the ERDA LMFBR Development Program, as well as the systematic and disciplined evaluations of the plant design to identify potential causes and pathways for serious accidents ... are of significant value"

- a. Identify and provide, by reference to the PSAR or other documents where appropriate, the exact reference to each of the abovementioned numerical evaluations of systems reliability, accident risks, and plant design. Do the same with respect to any such evaluations performed or evaluated since the writing of the Denise-Caffey letter.
48. In Staff's evaluation of site suitability and containment adequacy for the Fast Flux Test Facility, identify and provide detailed justification for Staff's assumptions concerning:
- a. the percentage of sodium released from the reactor vessel to the secondary containment following a maximum credible core disruptive accident;
 - b. the percentage of the fuel released from the reactor vessel to the secondary containment following a maximum credible core disruptive accident;
 - c. the percentage of the plutonium mass released from the reactor vessel to the secondary containment following a core disruptive accident.
49. Has Staff performed any qualitative analyses (e.g., probabilistic risk assessments) since April 23, 1977 to assess whether the inclusion of two separate, independent, redundant, and diverse shutdown systems

will reduce the probability of a CDA sufficiently so that it may be excluded from the design basis, particularly in light of post-TMI concerns regard human error, systems interactions and common mode failure? If the answer to this interrogatory is yes, identify and provide such analyses and any and all documents related thereto.

50. If the answer to the above interrogatory is no,
 - a. explain in detail why Staff has not performed such analyses;
 - b. explain whether and when Staff intends to perform such analyses;
 - c. identify the precise licensing stage, if any, for which Staff believes such analyses are necessary;
 - d. explain the precise extent, if any, to which Staff intends to rely upon a review of Applicants' quantitative analyses of the CRBR shutdown systems' adequacy in determining whether the CDA should be excluded as a DBA.
51. With regard to limiting overpower transients and undercooled events, what trip settings are relied upon to ensure that the following categories of events are accommodated within the design basis (i.e., the damage severity limits)?

- a. anticipated events;
 - b. unlikely events;
 - c. extremely unlikely events.
52. Explain in detail how and when the various trip settings and trip bypasses are set in order to scram the primary and secondary control rod systems, including whether they are set manually.
53. Is it possible that the various trip settings and trip bypasses used to scram the primary and secondary control rod systems could be set erroneously due to human error?

II. Contention 1

1. Identify whether core disruptive accidents are currently treated as design basis accidents in:
 - a. the French Phenix breeder reactor;
 - b. the French Super-Phenix breeder reactor;
 - c. the British PFR breeder reactor;
 - d. the West German SNR-300 (Kalkar) breeder reactor.
2. As a result of Staff's analysis of the CRBR heterogeneous core, indicate, for each design basis accident considered by Applicants, the number of
 - a. primary rods;
 - b. secondary rods,which Staff believes are necessary to ensure safe shutdown.

3. For every U.S. fast reactor constructed and operated to date, indicate whether CDAs were treated as though they were DBAs.
4. Explain in detail the
 - a. state of LMFBR technology,
 - b. prior experience with LMFBR systems, and
 - c. prior experience with LWR systemsthat Staff currently intends to rely upon to support its conclusion that CDAs should not be considered DBAs for the CRBR.
5. For each of the following core disassembly scenarios, compare the relative probability of failure to shutdown between the CRBR and the Fast Flux Test Facility:
 - a. Loss-of-Flow (LOF);
 - b. Transient Overpower (TOP);
 - c. LOF-driven-TOP.

Identify and provide all documents in the possession of Staff which form the basis for your answer to this interrogatory.

6. If Staff determines that the two shutdown systems proposed by Applicants are not sufficiently reliable to enable Staff to exclude CDAs as DBAs, explain in detail the additional measures, if any, Staff will require of Applicants to lower the possibility of CDAs for CRBR.

7. If Staff determines that the decay heat removal systems proposed by Applicants are not sufficiently reliable to enable Staff to exclude CDAs as DBAs, explain in detail the additional measures, if any, Staff will require of Applicants to lower the possibility of CDAs for CRBR.
8. If Staff determines that the heat transport system proposed by Applicants is not sufficiently reliable to enable Staff to exclude CDAs as DBAs, explain in detail the additional measures, if any, Staff will require of Applicants to lower the possibility of CDAs for CRBR.
9. If Staff determines that the containment system proposed by Applicants is not sufficiently reliable to enable Staff to exclude CDAs as DBAs, explain in detail the additional measures, if any, Staff will require of Applicants to lower the possibility of CDAs for CRBR.
10. If Staff determines that the fuel fault propagation protection measures proposed by Applicants are not sufficiently reliable to enable Staff to exclude CDAs as DBAs, explain in detail the additional measures, if any, Staff will require of Applicants to lower the possibility of CDAs for CRBR.

11. Define the term "a reactor of the general size and type proposed" for purposes of the LWA-1 review for CRBR.
12. Have there been any reactors "of the general size and type" of the CRBR licensed or operated in the U.S.? Identify any such.
13. Have there been any reactors "of the general size and type" of the CRBR licensed or operated abroad? Identify any such.
14. Is the so-called "parallel design" for CRBR as described in the ongoing Appendix F to the PSAR a "reactor of the general size and type proposed"?

III. Contention 2

1. Explain in detail Staff's current position on the precise effect on Staff's CRBR source term calculations of:
 - a. including CDAs as DBAs;
 - b. defining CDAs as credible accidents.State whether this position is a final position.
2. Explain in detail Staff's current position regarding the precise effect on Staff's design requirements for CRBR of:
 - a. including CDAs as DBAs;
 - b. defining CDAs as credible accidents.State whether this position is a final position.

3. What is Staff's current definition of a CDA? State whether this position is a final position.
4. What is Staff's current estimate of the exact quantitative probability of a CDA;
 - a. for the CRBR as currently designed;
 - b. for a reactor of the general size and type proposed.

For each answer to this interrogatory, identify and produce any and all documents in the possession of Staff upon which Staff relies in formulating its answer, and state whether this position is a final position.

5. What is Staff's current estimate of the exact quantitative probability of a CDA whose consequences exceed the 10 CFR 100 dose guidelines
 - a. for the CRBR as currently designed;
 - b. for a reactor of the general size and type proposed.

For each answer to this interrogatory, identify and produce any and all documents in the possession of Staff upon which Staff relies in formulating its answer, and state whether Staff's position is a final position.

6. State Staff's current estimate of the exact quantitative probability of each CDA initiator:

- a. for the CRBR as currently designed;
- b. for a reactor of the general size and type proposed.

For each answer to this interrogatory, identify and produce any and all documents in the possession of Staff upon which Staff relies in formulating its answer and state whether this position is a final position.

- 7. State Staff's current estimate of the exact quantitative probability of each CDA initiator whose consequences exceed the 10 CFR 100 dose guidelines
 - a. for the CRBR as currently designed;
 - b. for a reactor of the general size and type proposed.

For each answer to this interrogatory, identify and produce any and all documents in the possession of Staff upon which Staff relies in formulating its answer and state whether this position is a final position.

- 8. State Staff's current position on which exact quantitative probability level for a CDA is acceptably low for purposes of Staff's environmental review. State whether this position is a final position.
- 9. Explain in detail Staff's current position on whether the probability of core melt and disruptive accidents

can be reduced to a sufficiently low level to justify their exclusion from the design basis accident spectrum. Identify and provide any and all documents in the possession of Staff upon which Staff relies in formulating its answer and state whether such position is a final position.

10. Is Staff's current choice of an appropriate CRBR source term based on the assumption that:
 - a. a CDA can be made an incredible event?
 - b. a CDA must be made an incredible event?
 - c. a CDA with consequences in excess of 10 CFR 100 guidelines can be made an incredible event?
 - d. a CDA with consequences in excess of 10 CFR 100 guidelines must be made an incredible event?
11. Would Staff assume a larger CRBR source term if it were shown that a CDA is a credible accident?
12. Would Staff's choice of appropriate 10 CFR 100 lung and bone dose guideline values change if CDAs were included as DBAs?
13. Would Staff's statement that "the probability of core melt and disruptive accidents can and must be reduced to a sufficiently low level to justify their exclusion from the design basis accident spectrum" change if the 10 CFR 100 lung and bone dose guideline values were lowered?

14. Explain in detail Staff's current position regarding the proper source term to be used in calculating CRBR site suitability, in particular the percentage of plutonium inventory that should be used in such source term.
 - a. Identify and provide all documents in possession of Staff dated since April 23, 1977 which form the basis for Staff's current position.
 - b. Identify, date, and provide all mechanistic calculations, if any, performed since April 23, 1977, upon which Staff relied in forming its current position.
 - c. Identify each principal person who performed the calculations identified in subpart (b) above.
 - d. Identify the reactor design assumed for each of the calculations identified in subpart (b) above.
 - e. Identify any and all computer codes developed since April 23, 1977 upon which Staff relied in forming its current position.
 - f. Indicate whether Staff's current position is preliminary or final for purposes of the LWA-1 hearing.
 - g. Will the source term for CRBR be reconsidered after issuance of an LWA-1, if an LWA-1 is granted? Describe the information, data, analyses and calculations related to identifying a source

term for CRBR that will be considered and reviewed by Staff at the CP stage that will not be considered or reviewed at the LWA-1 stage.

h. If Staff's current position, whether preliminary or final, regarding the appropriate CRBR source term has changed in any way from its position as of April 23, 1977, explain in detail each such change and the reason(s) for such change.

15. Would Staff change its position that "the probability of core melt and disruptive accidents can be reduced to a sufficiently low level to justify their exclusion from the design basis accident spectrum" if the 10 CFR Part 100 guidelines for lung and bone doses from plutonium of 75 and 150 rems, respectively, assumed by Staff, were lowered by a factor of:

- a. 2
- b. 5
- c. 10
- d. 50
- e. 100?

If the answer is that the quoted Staff position would not be affected by a change in the indicated guideline values, please explain in detail the basis for this answer.

16. Would Staff change its position that "the probability of core melt and disruptive accidents must be reduced to a sufficiently low level to justify their exclusion from the design basis accident spectrum" if the 10 CFR Part 100 guidelines for lung and bone doses from plutonium of 75 and 150 rems, respectively, assumed by Staff, were lowered by a factor of:

- a. 2
- b. 5
- c. 10
- d. 50
- e. 100?

If the answer is that the quoted Staff position would not be affected by a change in the indicated guideline values, please explain in detail the basis for this answer.

17. Would Staff change its position that "the Staff will not consider CDAs as design basis accidents" if the 10 CFR Part 100 guidelines for lung and bone doses from plutonium of 75 and 150 rems, respectively, assumed by Staff, were lowered by a factor of:

- a. 2
- b. 5
- c. 10
- d. 50
- e. 100?

If the answer is that the quoted Staff position would not be affected by a change in the indicated guideline values, please explain in detail the basis for this answer.

18. Identify and describe any and all test data received by Applicants since April, 1977 regarding the Sodium Loop Safety Facility or TREAT that indicate
 - a. the amount of fuel slumping following a core disruptive accident;
 - b. the capability of the models SLUMPY and PLUTO2 to predict the amount of fuel slumping following a core disruptive accident;
 - c. the amount of channel blockage following a CDA;
 - d. the capability of the models SLUMPY and PLUTO2 to predict the amount and location of channel blockage following a CDA.
19. Identify and produce all American Nuclear Society LMFBR design criteria (See Transcript of the Feb. 2, 1982 ACRS CRBR Subcommittee meeting, p. 75) that do not appear in Appendix A of the March 1977 Staff Site Suitability Report.
20. For each combination of the following possible accident scenarios, core design, location of cladding failure, energetics of molten fuel-coolant interaction, and fuel configuration, rank the combinations in order of their

- a. potential for energetic core disassembly;
- b. amount of energetics associated with core disassembly.

I. accident scenarios

- i. loss-of-flow (LOF);
- ii. transient overpower (TOP);
- iii. LOF-driven-TOP.

II. core design

- i. homogenous
- ii) heterogeneous

III. axial location of initial cladding failure

- i) near the top of the core
- ii) at or near midplane of the core

IV. energetics of molten fuel-coolant interaction

- i) highly energetic
- ii) non-energetic

V. fuel configurations

- i) beginning-of-cycle-1 (BOC-1)
- ii) end-of-cycle-4 (EOC-4)

21. For each of the following three core disassembly scenarios identify the six most important parameters or assumptions underlying such scenario (e.g., location of failure) in terms of their potential impact on energetics and the CRBR's capability to accomodate such energetics (keeping in mind the uncertainties in our knowledge):

- a. Loss-of-Flow (LOF);
 - b. Transient Overpower (TOP);
 - c. LOF-driven-TOP
22. Identify each CRBR component with a potential impact on the capability of CRBR to accommodate a CDA whose design or other aspect has been changed since April 23, 1977.
- a. For each component identified above, explain in detail the impact of such change on the potential consequences of a CDA.
23. In light of the TMI accident, to what extent is the CRBR design adequate with respect to its capability to remove core material from the reactor following a CDA and reactor vessel rupture?
24. Does Staff agree with Applicants that a proper design objective for assuring that no cladding melting and loss of coolable core geometry occur is prevention of a sodium temperature at which boiling would occur?
- a. If the answer to this interrogatory is yes, explain in detail why Staff would not impose a design objective of preventing a sodium temperature some 100-200° below that at which boiling would occur, in order to assure an adequate margin of safety?

25. With respect to Interrogatories I 1, 3, 4, 6, 8, 20-24, 26, 37(d), 38-40, 45-47; II 2, 4-10; III 1-3, 8-11, 14-17 explain in detail how Staff's answer would change, if at all, were the interrogatory reworded to apply to a reactor of the general size and type as the CRBR, instead of specifically to the CRBR.

IV. Contentions 4 and 6(b)(4)

1. Since April 25, 1977, has the Staff prepared or received any documents which discuss:
 - a. the costs of safeguards and physical security at the CRBR and supporting fuel cycle facilities;
 - b. the risks and consequences of safeguards and/or physical security failure at the CRBR and supporting fuel cycle facilities;
 - c. the nature and scope of projected, future threats from terrorists, saboteurs, and thieves to the CRBR and supporting fuel cycle facilities?

If the answer to any part of this interrogatory is yes, identify and produce such documents.

2. Since April 25, 1977, has the Staff prepared or received any documents which discuss the possibility that an act of sabotage or terrorism could be a CDA initiator at the CRBR? If the answer to this interrogatory is yes, identify and produce such documents.

3. a. State what specific measures have been adopted since April 25, 1977, to improve safeguards and physical security at the CRBR and supporting fuel cycle facilities;
- b. For each such measure, specify (i) its cost, and (ii) the reasons for its adoption.
4. a. State what alternatives to the planned safeguards and physical security systems at the CRBR and supporting fuel cycle facilities are currently under consideration.
- b. For each alternative stated, specify (i) its cost, and (ii) the reasons which would support its adoption.
5. Specify the ways, if any, that the threat to the CRBR and supporting fuel cycle facilities has changed since April 25, 1977.

V. Contention 5

1. Provide the information requested below for each of the following facilities:
 - a. Oak Ridge National Laboratory;
 - b. Y-12 Plant; and
 - c. K-25 Plant (Oak Ridge Gaseous Diffusion Plant);
 - (1) Describe the national security functions(s), if any, performed at each facility.

- (2) If evacuation of such facility were required, how many people would be required to remain at each facility for
 - (a) national security reasons?
 - (b) other reasons?
- (3) During an evacuation, how many people would be required to remain at each facility for national security or other reasons if the whole body dose to such people were likely to reach:
 - (a) 1 rem;
 - (b) 5 rems;
 - (c) 25 rems;
 - (d) 100 rems;
 - (e) 250 rems;
 - (f) 500 rems.
- (4) Identify fully the national security impact, if any, of losing access to each facility:
 - (a) for one week;
 - (b) for one month;
 - (c) for three months;
 - (d) for six months;
 - (e) for one year;
 - (f) indefinitely.

- (5) Identify to what extent, if any, the Staff judgment regarding the adequacy of the evacuation plans for each facility is based on the CRBR site suitability source term assumed by Staff in the May 6, 1976 letter from Denise to Caffey.
- (6) In assessing the adequacy of the evacuation plan for each facility, what were Staff's assumptions regarding:
 - (a) the 2-hour doses at such facility?
 - (b) the 30-day doses at such facility?
 - (c) the basis for calculating the 2-hour doses at each facility?
 - (d) the basis for calculating the 30-day doses at each facility?

VI. Contention 6

- 1. Identify each fuel cycle facility (including fuel production, storage, preparation, fabrication, reprocessing, spent fuel storage, and waste disposal facilities) that is likely to be used in the CRBR fuel cycle throughout its entire operating life.
- 2. Indicate whether Staff takes the position that the following regulations apply to each of the facilities identified in response to Question 1 above:

- a. 10 CFR § 50.34(c);
 - b. 10 CFR Part 20;
 - c. 10 CFR Part 60;
 - d. 10 CFR Part 70;
 - e. 10 CFR Part 71;
 - f. 10 CFR Part 73.
3. For each of the facilities and regulations identified in Questions 1 and 2 above, if Staff's response is that a specific regulation on a particular subject does not apply to a facility, indicate which regulation(s) on that subject do apply to such facility and specify each and every difference in the regulations.
4. Identify each environmental impact associated with the operation of each of the following DOE reprocessing plants that (i) is likely to be used or (ii) may be used to supply fuel for the CRBR or to reprocess CRBR fuel:
 - a. the Savannah River plant (H canyon);
 - b. the Savannah River plant (F canyon);
 - c. the Idaho National Engineering Laboratory;
 - d. the Hanford PUREX plant.
5. How will the following materials be disposed of:
 - a. CRBR spent fuel;
 - b. high-level waste from the reprocessing of CRBR fuel;

- c. high-level waste from the reprocessing of LWR fuel to recover plutonium for the CRBR.
- 6. Does Staff take the position that Applicants must meet the provisions of 10 CFR Part 71 with respect to the transportation of materials in the CRBR fuel cycle?
- 7. Will the disposal of wastes generated from the CRBR spent fuel, including high-level wastes from reprocessing,
 - (a) be subject to:
 - i. NRC jurisdiction?
 - ii. EPA jurisdiction?
 - (b) be classified as defense waste?
 - (c) be classified as commercial waste?

VII. Contention 7

- 1. Has the French Phenix reactor demonstrated the technical performance of an LMFBR central station electric powerplant in a utility environment?
- 2. Has the French Phenix reactor demonstrated the reliability of an LMFBR central station electric powerplant in a utility environment?
- 3. Has the French Phenix reactor demonstrated the maintainability of an LMFBR central station electric powerplant in a utility environment?

4. Has the French Phenix reactor demonstrated the safety of an LMFBR central station electric powerplant in a utility environment?
5. Has the French Phenix reactor demonstrated the environmental acceptability of an LMFBR central station electric powerplant in a utility environment?
6. Has the French Phenix reactor demonstrated the economic feasibility of an LMFBR central station electric powerplant in a utility environment?
7. If the answer to any of Questions 1-6 above is other than yes, explain precisely the reason for the answer and what changes would be, or would have been necessary for such a demonstration.
8. With respect to each of Questions 1-6 above, explain in detail the basis, if any, for believing the answer would be any different if the Phenix reactor were operated in a U.S. utility environment. Would, for example, the difference in safety requirement be so severe as to detrimentally affect reliability, or environmental acceptability?
9. Has the value of the LMFBR for conserving important nonrenewable natural resources (i.e. uranium) been confirmed? If the answer is other than yes, explain in detail why this value of the LMFBR has not been confirmed and what would be necessary for such a confirmation.

10. Has the value of the Light Water Breeder for conserving important nonrenewable resources (i.e. uranium) been confirmed? If the answer is other than yes, explain in detail the basis for the answer.
11. Could the technical performance of the CRBR be demonstrated if for any reason the plant could not operate
 - a. at all;
 - b. for more than 1 year;
 - c. for more than 2 years;
 - d. for more than 3 years;
 - e. for more than 5 years.
12. Could the reliability of the CRBR be demonstrated if for any reason the plant could not operate
 - a. at all;
 - b. for more than 1 year;
 - c. for more than 2 years;
 - d. for more than 3 years;
 - e. for more than 5 years.
13. Could the maintainability of the CRBR be demonstrated if for any reason the plant could not operate
 - a. at all;
 - b. for more than 1 year;
 - c. for more than 2 years;
 - d. for more than 3 years;
 - e. for more than 5 years.

14. Could the safety of the CRBR be demonstrated if for any reason the plant could not operate
 - a. at all;
 - b. for more than 1 year;
 - c. for more than 2 years;
 - d. for more than 3 years;
 - e. for more than 5 years.
15. Could the environmental acceptability of the CRBR be demonstrated if for any reason the plant could not operate
 - a. at all;
 - b. for more than 1 year;
 - c. for more than 2 years;
 - d. for more than 3 years;
 - e. for more than 5 years.
16. Could the economic feasibility of the CRBR be demonstrated if for any reason the plant could not operate
 - a. at all;
 - b. for more than 1 year;
 - c. for more than 2 years;
 - d. for more than 3 years;
 - e. for more than 5 years.

17. How much would the CRBR have to cost before the project would be unable to demonstrate the economic feasibility of an LMFBR central station electric powerplant in a utility environment?
18. Specify the criteria by which the Staff is judging the likelihood that the CRBR will meet its programmatic objectives. Provide any memoranda documents, etc. relating to the criteria which NRC is using to determine the likelihood that CRBR will meet its programmatic objectives.
19. What is Staff's current position on whether the following objectives of the LMFBR program could be demonstrated if for any reason issuance of a construction permit was delayed for 2-3 years:
 - a. technical performance;
 - b. reliability;
 - c. maintainability;
 - d. safety;
 - e. environmental acceptability;
 - f. economic feasibility;
 - g. timely construction (as expeditiously as possible).State whether this position is a final position.
20. What is Staff's current position on whether the following objectives of the LMFBR program could be demonstrated if for any reason the CRBR Project were unable to meet Staff's safety requirements:

- a. technical performance;
- b. reliability;
- c. maintainability;
- d. safety;
- e. environmental acceptability;
- f. economic feasibility.

State whether this position is a final position.

21. What is the Staff position with regard to the likelihood that the CRBR will meet its programmatic objectives? Provide all information, analyses, discussions by NRC, its consultants, DOE, its consultants, or Applicant bearing on this question.

VIII. Contention 8

- 1. What are the environmental impacts of decommissioning CRBR?
- 2. What are the unavoidable adverse environmental effects associated with decommissioning CRBR?
- 3. Provide all documents, analyses, memoranda, calculations, evaluations, assessments, etc., related to the environmental impacts and/or unavoidable adverse environmental effects associated with decommissioning CRBR.
- 4. Provide all documents, analyses, evaluations, assessments, etc., upon which the Staff relies in

assessing for purposes of NEPA review the environmental impacts and/or unavoidable adverse environmental effects associated with decommissioning CRBR.

5. Identify the Staff member(s) and consultants working on the NEPA review as it relates to decommissioning impacts. Provide a description of his/her background and experience.
6. Have any analyses been undertaken of neutron activation products which Staff relies upon to determine
 - a. the potential isolation period of the CRBR following decommissioning?
 - b. the economic costs of decommissioning the CRBR?
 - c. the environmental costs of decommissioning the CRBR?
 - d. the societal costs of decommissioning the CRBR?If the answer to any part of this interrogatory is yes, identify and produce such assessments and any and all documents in the possession of Staff relating thereto.
7. If the answer to any part of the above interrogatory is that Staff does not rely on any analyses of neutron activation products, explain in detail why Staff believes that reliance on such analyses is unnecessary.

IX. General Questions

1. Provide the following information and documents relating to Staff review of the CRBR license application:
 - a. identify all Staff members presently assigned to review any portion of the CRBR license application (including both safety and environmental issues);
 - b. provide current resumes for each person identified in response to Question (a) above.
 - c. For each person described in response to Question (a) above, provide such person's qualifications to perform the CRBR licensing review.
 - d. For each person described in response to Question (a) above, explain in detail what portion of the CRBR license application such person is reviewing.
 - e. Identify each contractor engaged by Staff to assist in any aspect of the CRBR license review, or research any question related to review of the CRBR license application.
 - f. Identify each Staff member assigned to supervise the CRBR-related work of a contractor, and indicate the particular contractor's work each Staff member will be supervising.
 - g. For each person identified in response to Question (a) above, indicated whether such person has had any involvement whatsoever in the design,

construction, or licensing of LMFBR's prior to October 1, 1981, other than as a member of the Staff or as a contractor to the Staff.

- h. If the answer to Question (g) is yes, describe in detail the nature of such involvement.
- i. Provide copies of all contracts entered into between Staff and any person assisting in any aspect of the CRBR license review or researching any question related to review of the CRBR license application.
- j. Provide copies of any documents, reports, test results, or other information received by the Staff since April 23, 1977 from those persons indicated in response to Question (e) above.
- k. Intervenors understand that Staff keeps computer records indicating the time spent by each Staff member on review of the CRBR license application. Please indicate the amount of time spent by each Staff member in reviewing the CRBR license application since April 23, 1977. Intervenors wish to remind Staff that providing up-to-date answers to these and all other interrogatories is a continuing obligation.
- l. Identify all persons the Staff intends to produce as witnesses in the CRBR proceeding and describe with particularity the subject the witness will address.

2. Provide copies of any and all documents in the possession of Staff not previously provided to Intervenor, relating to communications between Staff and Applicants since April 23, 1977 regarding the licensing of the CRBR.
3. Provide copies of any and all documents in the possession of Staff not previously provided to Intervenor, relating to communications between Staff and ACRS since April 23, 1977 regarding the licensing of the CRBR.
4. Provide copies of any and all documents in the possession of Staff not previously provided to Intervenor, relating to communications between Applicants and ACRS since April 23, 1977 regarding the licensing of the CRBR.
5. Has Staff prepared a Standard Review Plan for the CRBR? If the answer to this interrogatory is yes, provide:
 - a. the Standard Review Plan;
 - b. any draft versions of the Standard Review Plan;
 - c. any documents used as inputs to the Standard Review Plan;
 - d. any and all other documents related to the Standard Review Plan.

6. If the CRBR Standard Review Plan has not yet been prepared or is only in draft form, provide any and all draft versions of the SRP prepared to date, and all other documents relating to, used in ,or to be used in preparation of the SRP.
7. If Staff has not yet issued the CRBR SRP, explain in detail the reasons why and indicate the date on which Staff intends to issue the CRBRP SRP.
8. Does Staff intend to issue a Safety Evaluation Report (SER) on the CRBR prior to commencement of the LWA-1 hearings? If the answer to this interrogatory is yes:
 - a. Explain in detail each matter to be evaluated in the SER.
 - b. Explain in detail and provide justification for the level of analysis the Staff intends to conduct on each such matter (e.g., will the matter be considered as a threshold issue or fully considered to the extent necessary for CP issuance?).
 - c. For each such matter, explain and justify how the evaluation or level of analysis will differ from that normally performed in an LWR SER.
 - d. For each such matter, explain in detail the extent to which additional analysis will be performed for CP issuance.

- e. Does the Staff intend to issue a second SER at the CP level?
 - f. What is Staff's current estimate of the date on which the SER will be issued?
 - g. Explain in detail whether the SER to be issued prior to the LWA hearing will include justification for any of the CRBR general and specific design criteria. If not, explain why not.
 - h. Identify and provide any and all draft versions of the SER, all documents constituting inputs to the SER, and all draft documents constituting inputs to the SER. Intervenor's remind Staff that the answers to this and all other interrogatories is a continuing obligation.
9. If Staff does not intend to issue an SER in any form prior to commencement of LWA-1 hearing, explain in detail the reason(s) why not.
10. If not previously answered, explain exactly what the Staff's review of the CRBR at the LWA-1 stage will consist of. Provide all memoranda or other documents, draft or final, describing the nature or scope of the CRBR review at the LWA-1 stage. Answer the same question for the construction permit stage.

11. Identify any Staff members and consultants who disagree with or dissent from the Staff's positions on NRDC's contentions. Provide any written documentation of their disagreement or dissent.

X. The Following Interrogatories Relate to the Contention Indicated in Parentheses Following Each Document, Event, or Program:

With regard to each of the following documents, events, or programs, indicate, by answering the following questions, the extent to which Staff has considered or intends to consider such document, event, or program in determining whether a supplement to the 1977 Final Environmental Statement on the CRBRP (NUREG-0139) must be prepared:

- a) Has Staff considered the impact of this document, event, or program?
- b) Does Staff consider this document, event, or program to represent significant new information or a significant change in circumstances?
- c) If the answer to (b) is yes, indicate the statement(s) or portion(s) of the FES which Staff intends to update as a result of this document, event, or program.

- d) If the answer to (b) is yes, indicate which conclusion(s) of the Staff in the FES will have to be updated as a result of this document, event, or program.
 - e) If answer to (a) is no, explain in detail why Staff has not considered such document, event, or program.
 - f) If answer to (b) is no, explain in detail the basis for Staff's conclusion that such document, event, or program does not represent significant new information or a significant change in circumstances.
 - g) If answer to (d) is "none," explain in detail why Staff does not intend to update any of its conclusions in the FES on the basis of such document, event, or program.
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- 1. Office of Nuclear Reactor Regulation, NRC, Report of the Siting Policy Task Force (NUREG-0625) (Aug. 1979) (Contention 7);
 - 2. Proposed revision of NRC reactor siting criteria (45 Fed. Reg. 50350, July 29, 1980) (Advance Notice of Proposed Rulemaking) (Contention 7);
 - 3. Proposed rule regarding the review of alternative sites under NEPA (45 Fed. Reg. 24168, April 9, 1980) (Contention 7);

4. Notice of Intent to Prepare an Environmental Impact Statement for revision of the Regulations Governing the Siting of Nuclear Power Plants (45 Fed. Reg. 79820, December 2, 1980) (Contention 7);
5. NRC, A Comparision of Site Evaluation Methods (NUREG/CR-1684) (July 1981) (Contention 7);
6. New emergency planning regulations (45 Fed. Reg. 55402, August 19, 1980) (Contention 5);
7. NRC and Federal Emergency Management Agency, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (NUREG-0654, FEMA-REP-1, Rev. 1) (Nov. 1980) (Contention 5);
8. NRC proposed rule requiring improvements in reactor design to reduce the risks from anticipated transients without scram ("ATWS") events (46 Fed. Reg. 57521, November 24, 1981) (Contention 1);
9. Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission (NUREG/CR-0400) (Contention 1);
10. Nuclear Regulatory Commission Statement of Risk Assessment in Light of the Risk Assessment Review Group Report, Jan. 18, 1979 (Contention 1);
11. U.S. Nuclear Regulatory Commission, NRC Action Plan Developed as a Result of the TMI-2 Accident (NUREG-0660) (Aug. 1980) (Contentions 1 and 3);

12. Report of the Reactor Safety Research Review Group (September 1981) (Contentions 1 and 3);
13. U.S. Nuclear Regulatory Commission, Identification of New Unresolved Safety Issues Relating to Nuclear Power Plants (NUREG-0705) (March 1981) (Contentions 1 and 3);
14. U.S. Nuclear Regulatory Commission, Safety Goals for Nuclear Power Plants. A Discussion Paper (NUREG-0880) (Feb 1982) (Contention 1);
15. New or revised computer codes used by Applicants to simulate accidents to determine their potential and magnitude. e.g., PSAR Section 12, Appendix A, CRBR GEF-00523 (Contention 2);
16. Significant changes in reactor vessel and core design that must be reflected in Applicants' accident modeling (See, e.g., PSAR Sections 4.1 and 4.2) (Contention 2);
17. New results on ongoing safety testing (see, e.g., pp. 118-135 of DOE EIS draft and footnotes 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 on pp. 141-144). see also General Electric, An Assessment of HCDA Energetics in the CRBRP Heterogeneous Reactor Core (December 1981) (Contention 2);
18. List of unresolved safety issues at time of suspension of CRBRP licensing proceeding: Letter, dated November 9, 1978, from W.P. Gammill to L.W. Caffey, "Summary of Outstanding Items." (Contentions 1, 2.);

19. "Licensing Requirements for Pending Construction Permit and Manufacturing License Applications" (47 Fed. Reg. 2286, January 15, 1982) (Contentions 1-3);
20. "Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License. March 1981 (NUREG-0718) (Rev. July 10, 1981) (Contentions 1-3);
21. Proposed rules to require improved hydrogen control capability during and following reactor accidents
 - a. 46 Fed. Reg. 62281, December 23, 1981;
 - b. 46 Fed. Reg. 57521;
 - c. 46 Fed. Reg. 2286 (Contention 2);
22. National Academy of Science, The Effects on Populations of Exposure to Low Levels of Ionizing Radiation (National Academy Press 1980) (BEIR III Report) (Contention 11);
23. Lowe and E. Mendelsohn, "Revised Dose Estimates at Hiroshima and Nagasaki" (UCRL 85446 preprint, 1 October 1980), available from Lawrence Livermore National Laboratory) and directly related reports (Contention 11);
25. Revisions to the ORIGEN Code since April 25, 1977 (Contention 11);
26. ICRP Reports 26 and 30 (Contention 11);

27. Cross, Palmer, Filipy, Dagle, and Stuart,
"Carcinogenic Effects of Radon Daughters, Uranium Ore
Dust and Cigarette Smoke in Beagle Dogs." (Pacific
Northwest Laboratory, Richland, Wash., April 24, 1981)
(Contention 11);
28. USEPA, "Proposed Federal Radiation Protection Guidance
for Occupational Exposure," EPA 520/4-81-003 (Jan. 31,
1981) (Contention 11);
29. John W. Gofman, Radiation and Human Health (Sierra
Club Books, San Francisco 1981) (1000 p.)
(Contention 11);
30. NRC revisions to Regulatory Guide 8.8, "Information
Relevant to Ensuring that Occupational Radiation
Exposures at Nuclear Power Stations Will be as Low as
is Reasonably Achievable." (NRC Office of Standards
Development) (Rev. 2, March 1977) (Contention 1);
31. Changes in Applicants Radiation Protection Program
(see PSAR Section 12, Amendments 40, 44, 45, 49 and
52) (Contention 11);
32. New Regulatory Guides related to radiation protection,
listed in letter, dated January 13, 1982 frn Paul S.
Check to John R. Longenecker (Contention 11);
33. Applicants' analysis of CRBR accident scenarios (see
CRBR Safety Study, CRBRP-1, March 1977) (Contention 3);

34. New data related to an LMFBR's ability to accomodate core debris following a core disruptive accident (see, e.g., footnotes 36, 37, 39 and 40 on p. 143 of DOE draft supplemental LMFBR impact statement) (Contention 3);
35. New proposed legislation and proposed regulations on siting and construction of waste disposal facilities:
 - a. 46 Fed. Reg. 35280 (July 8, 1981);
 - b. 46 Fed. Reg. 221 (November 15, 1978) (Contention 6);
36. New regulations on transportation of high level radioactive wastes: 45 Fed. Reg. 34446 (June 15, 1979) (Contention 6);
37. Minutes of April 23, 1981 Meeting between DOE and Nuclear Industry Representatives concerning potential for commercial reprocessing (statement of Brian D. Farrow, Senior Vice President and General Counsel, Allied Commercial Corp. and W. Creighton Galloway, Exec. Vice President, General Atomic Co., "Prospects for Private Investment in Nuclear Fuel Reprocessing") (Contention 6);
38. New NRC regulations on physical security (10 CFR § 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage) (Contention 4);

39. Department of Energy, Nuclear Proliferation and Civilian Nuclear Power: Report of the Nonproliferation Alternative Systems Assessment Programs (DOE/NE-0001/7) (June 1980) (Contention 4);
40. Proposed NRC rules concerning material control and accountability requirements for licensees possessing special nuclear materials (46 Fed. Reg. 45144 (September 10, 1981)) (Advance Notice of Proposed Rulemaking) (Contention 4);
41. Recent GAO reports concerning safeguards and physical security (Contention 4):
 - a. "Security at Nuclear Powerplants -- At Best, Inadequate" (4/7/77);
 - b. Unclassified summary of a classified report entitled, "Commercial Nuclear Fuel Facilities Need Better Security" (5/2/77);
 - c. Letter to Chairman, John Dingell, U.S. House of Representatives, Re: unaccounted for nuclear material (5/5/78);
 - d. Unclassified summary of a classified report entitled, "Status of Physical Security Improvements to ERDA Special Nuclear Material Facilities" (9/87/77);
 - e. "Federal Actions are Needed to Improve Safety and Security of Nuclear Materials Transportation" (5/7/79);

- f. Unclassified summary of classified report entitled, "U.S. Nuclear Safeguards -- A National Strategy is Need" (2/19/80);
 - g. "Nuclear Fuel Reprocessing and the Problems of Safeguarding Against the Spread of Nuclear Weapons" (3/18/80);
 - h. Letter to Rep. Tim Wirth, Re: Alleged missing material from DOE's Rocky Flats weapons production plant (10/1/80);
 - i. "Nuclear Diversion in the U.S.? 13 Years of Contradiction and Confusion" (1/18/78) Classified report with no unclassified summary.
42. See "A Long-Term Problem for the Nuclear Industry," Science, Vol. 215 (January 22, 1982) (Contention 8);
43. U.S. Navy, Notice of Intent To Prepare an Environmental Impact Statement, 47 Fed. Reg. 2151 (January 14, 1982), on plan to dispose of retired nuclear submarines in the ocean) (Contention 8).

XI. The Following Interrogatories Relate to the Contention(s) Indicated in Parentheses Following Each Document, Event, or Program:

With regard to each of the following documents, events, or programs, indicate, by answering the following questions, the extent to which Staff has considered or intends to consider

such document, event, or program in determining whether a supplement or update to the March, 1977 Staff Site Suitability Report on the Clinch River Breeder Reactor Plant (SSR) must be prepared:

- a) Has Staff considered the impact of this document, event, or program on its site suitability analysis?
- b) Does Staff consider this document, event, or program to represent significant new information or a significant change in circumstances?
- c) If the answer to (b) is yes, indicate the statement(s) or portion(s) of the SSR which Staff intends to update as a result of this document, event, or program.
- d) If the answer to (b) is yes, indicate which conclusion(s) of the Staff in the SSR will have to be updated as a result of this document, event, or program.
- e) If answer to (a) is no, explain in detail why Staff has not considered such document, event, or program.
- f) If answer to (b) is no, explain in detail the basis for Staff's conclusion that such document, event, or program does not represent significant new information or a significant change in circumstances.

g) If answer to (d) is "none," explain in detail why Staff does not intend to update any of its conclusions in the SSR on the basis of such document, event, or program.

1. Office of Nuclear Reactor Regulation, NRC, Report of the Siting Policy Task Force (NUREG-0625) (Aug. 1979) (Contention 7);
2. Proposed revision of NRC reactor siting criteria (45 Fed. Reg. 50350, July 29, 1980) (Advance Notice of Proposed Rulemaking) (Contention 7);
3. Proposed rule regarding the review of alternative sites under NEPA (45 Fed. Reg. 24168, April 9, 1980) (Contention 7);
4. Notice of Intent to Prepare an Environmental Impact Statement for revision of the regulations governing the Siting of Nuclear Power Plants (45 Fed. Reg. 79820, December 2, 1980) (Contention 7);
5. NRC, A Comparision of Site Evaluation Methods (NUREG/CR-1684) (July 1981) (Contention 7);
6. New emergency planning regulations (45 Fed. Reg. 55402, August 19, 1980) (Contention 5);
7. NRC and Federal Emergency Management Agency, Criteria for Preparation and Evaluation of Radiological

Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (NUREG-0654, FEMA-REP-1, Rev. 1) (Nov. 1980) (Contention 5);

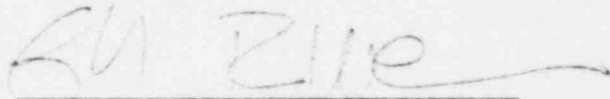
8. NRC proposed rule requiring improvements in reactor design to reduce the risks from anticipated transients without scram ("ATWS") events (46 Fed. Reg. 57521, November 24, 1981) (Contention 1);
9. Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission (NUREG/CR-0400) (Contention 1);
10. Nuclear Regulatory Commission Statement of Risk Assessment in Light of the Risk Assessment Review Group Report, Jan. 18, 1979 (Contention 1);
11. U.S. Nuclear Regulatory Commission, NRC Action Plan Developed as a Result of the TMI-2 Accident (NUREG-0660) (Aug. 1980) (Contentions 1 and 3);
12. Report of the Reactor Safety Research Review Group (September 1981) (Contentions 1 and 3);
13. U.S. Nuclear Regulatory Commission, Identification of New Unresolved Safety Issues Relating to Nuclear Power Plants (NUREG-0705) (March 1981) (Contentions 1 and 3);
14. U.S. Nuclear Regulatory Commission, Safety Goals for Nuclear Power Plants: A Discussion Paper (NUREG-0880) (Feb 1982) (Contention 1);

15. Changes in the computer codes used by Applicants to simulate accidents to determine their potential and magnitude. e.g., PSAR Section 12, Appendix A and CRBR GEFR-00523 (Contention 2);
16. Significant changes in reactor vessel and core design that must be reflected in Applicants' accident modeling (See, e.g., PSAR Sections 4.1 and 4.2) (Contention 2);
17. New results on ongoing safety testing (see, e.g., pp. 118-135 of DOE EIS draft and footnotes 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 on pp. 141-144). see also General Electric, An Assessment of HCDA Energetics in the CRBRP Heterogeneous Reactor Core (December 1981) (Contention 2);
18. List of unresolved safety issues at time of suspension of CRBRP licensing proceeding: Letter, dated November 9, 1978, from W.P. Gammill to L.W. Caffey, "Summary of Outstanding Items" (Contentions 1, 2);
19. "Licensing Requirements for Pending Construction Permit and Manufacturing License Applications" (47 Fed. Reg. 2286, January 15, 1982) (Contentions 1-3);
20. "Licensing Requirements for Pending Applications for Construction Permits and Manufacturing License. March 1981 (NUREG-0718) (Rev. July 10, 1981) (Contentions 1-3);

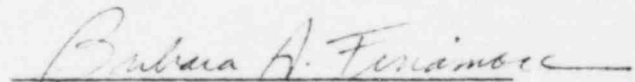
21. Proposed rules to require improved hydrogen control capability during and following reactor accidents:
 - a. 46 Fed. Reg. 62281, December 23, 1981;
 - b. 46 Fed. Reg. 57521;
 - c. 46 Fed. Reg. 2286 (Contention 2);
22. National Academy of Science, The Effects on Populations of Exposure to Low Levels of Ionizing Radiation (National Academy Press 1980) (BEIR III Report) (Contention 11);
23. Lowe and E. Mendelsohn, "Revised Dose Estimates at Hiroshima and Nagasaki" (UCRL 85446 preprint, 1 October 1980), available from Lawrence Livermore National Laboratory) and other directly related reports (Contention 11);
24. Revisions to the ORIGIN Code since April 25, 1977 (Contention 11);
25. ICRP Reports 26 and 30 (Contention 11);
26. Cross, Palmer, Filipy, Dagle, and Stuart, "Carcinogenic Effects of Radon Daughters, Uranium Ore Dust and Cigarette Smoke in Beagle Dogs." (Pacific Northwest Laboratory, Richland, Wash., April 24, 1981) (Contention 11);
27. USEPA, "Proposed Federal Radiation Protection Guidance for Occupational Exposure," EPA 520/4-81-003 (Jan. 31, 1981) (Contention 11);

28. John W. Gofman, Radiation and Human Health (Sierra Club Books, San Francisco 1981) (Contention 11);
29. NRC revisions to Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will be as Low as is Reasonably Achievable." (NRC Office of Standards Development) (Rev. 2, March 1977) (Contention 1);
30. Changes in Applicants Radiation Protection Program (see PSAR Section 12, Amendments 40, 44, 45, 49 and 52) (Contention 11);
31. New Regulatory Guides related to radiation protection, listed in letter, dated January 13, 1982 from Paul S. Check to John R. Longenecker (Contention 11);
32. Applicants' analysis of CRBR accident possibilities (see CRBR Safety Study, CRBRP-1, March 1977) (Contention 3);
33. New data related to an LMFBR's ability to accomodate core debris following a core disruptive accident (see, e.g., footnotes 36, 37, 39 and 40 on p. 143 of DOE draft supplemental LMFBR impact statement) (Contention 3);

Respectfully submitted,



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