

RELATED CORRESPONDENCE

April 22, 1983

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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

RESPONSE OF INTERVENORS, NATURAL RESOURCES
DEFENSE COUNCIL, INC. AND THE SIERRA CLUB,
TO APPLICANTS' NINTH SET OF INTERROGATORIES
DATED APRIL 8, 1983

Pursuant to 10 CFR § 2.740b, and in accordance with the Board's Construction Permit Scheduling Order of March 29, 1983, Intervenor, Natural Resources Defense Council, Inc. and the Sierra Club, hereby respond to Applicants' Ninth Set of Interrogatories, dated April 8, 1983.

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General Answers

(a) & (b) Documents other than the PSAR and SER are identified below in the direct response to each question.

(c) Thomas B. Cochran is the primary Intervenor employee who provided the answer to each question.

(d) Intervenor have not yet identified any such experts.

CONTENTIONS 1, 2 and 3

Interrogatory

1. Identify and describe in detail all statements, analyses and conclusions in Chapter 15 of the PSAR with which Intervenor disagree. The response to this interrogatory must include a detailed description or explanation of all bases for Intervenor's disagreement.

a. As to each such statement, analysis or conclusion, describe all analyses performed by Intervenor which support Intervenor's position.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's basic position with regard to Applicants' CRBR accident analysis regarding Contentions 1, 2 and 3 are set forth in our LWA-1 Testimony, Proposed Findings of Fact and Contentions of Law, and in the Contentions themselves. Intervenor have not undertaken a line-by-line analysis of Chapter 15 of the PSAR and do not intend to conduct such a research effort, but will continue to rely on the PSAR as a reference document as the need arises.

Interrogatory

2. Identify all statements, analyses and conclusions in Chapter 15 of the SER with which Intervenor's disagree. The response to this interrogatory must include a detailed description or explanation of all bases for Intervenor's disagreement.

a. As to each such statement, analysis or conclusion, describe all analyses performed by Intervenor's which support Intervenor's position.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

See the Response to Interrogatory 1 above, substituting "SER" for "PSAR".

Interrogatory

3. State whether Intervenor's agree that all potential reactor accidents involving the core must involve either reduced heat removal or excessive heat generation or both.

a. If Intervenor's disagree, describe in detail the basis for the disagreement and provide a list of all additional conditions other than reduced heat removal or excessive heat generation involved in all potential reactor accidents related to the core.

b. For each category of condition identified above, describe the physical principles which lead Intervenor's to conclude that the condition is involved in all potential reactor accidents related to the core.

c. Identify all documents which support Intervenor's response to this interrogatory.

Response

In the context of Contentions 1, 2, and 3, the answer is yes.

Interrogatory

4. State whether Intervenor's agree that reduced whole core heat removal could occur in only two ways: (1) reduced primary coolant flow through the core; and/or (2) increased primary coolant temperature at the core inlet. If Intervenor's disagree, describe in detail the basis for the disagreement including a description of any additional causes of reduced whole core heat removal.

a. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors agree with this statement.

Interrogatory

5. State whether Intervenors agree that the bounding loss of pumping power design basis accident (DBA) is the simultaneous failure of all three pump motors and the subsequent coastdown of all three primary pumps.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. If Intervenors disagree, describe in detail the bounding loss of pumping power DBA.

c. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have no basis for disagreeing with Applicants' use of this event to define what Applicants refer to as the "Bounding loss of pumping power DBA." Obviously, more severe events can occur; e.g. station blackout while operating on two loops, or simultaneous failure of all three pump motors and seizure of one pump.

Interrogatory

6. Describe in detail any failure mode of which Intervenors are aware which would result in the simultaneous seizure of more than one pump in the primary heat transport system.

a. As to each failure mode described above, state whether Intervenors believe that such failure mode is credible.

b. As to any failure mode which Intervenors believe is credible, describe in detail any analysis, testing, or operating experience, or any other data which supports Intervenors' position that such failure mode is credible.

c. Identify all documents which support Intervenors' response to this interrogatory.

Response

One such failure mode would be the sabotage of two pumps.

a. Because the Staff has a circular definition of credible (See Intervenor's Findings of Fact), Intervenor is unable to answer this query. We are not aware of any quantitative risk assessment of this failure mode.

b.-c. See "a." above.

Interrogatory

7. State whether Intervenor agrees that the CRBRP design basis leak represents loss of a very small fraction of the total core flow and thus does not represent a significant reduction of heat removal capability.

a. If Intervenor disagrees, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor has no basis for disagreeing with this statement at this time.

Interrogatory

8. State whether Intervenor agrees that the bounding DBA for whole core heat removal due to increased core inlet temperature is the complete and instantaneous stoppage of all heat removal from one intermediate heat exchanger (IHX) while the reactor is operating at full power.

a. If Intervenor disagrees, describe in detail the basis for the disagreement, including a description of any alternative design basis accident due to increased core inlet temperature.

b. As to any alternative design basis accident identified by Intervenor, state whether Intervenor believes such design basis accident is credible and identify any analyses, tests, prior experience or any other data which support Intervenor's position that such design basis accident is credible.

c. State whether Intervenor agrees that instantaneous stoppage of intermediate heat transport system (IHTS) sodium flow is not physically possible. If Intervenor disagrees, describe in detail the basis for the disagreement.

d. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors have no basis for agreeing or disagreeing with this statement at this time.

Interrogatory

9. State whether Intervenor's agree that simultaneous mechanical failure of components (pumps, pipes and steam generators) in more than one IHTS loop are not credible.

a. If Intervenor's disagree, describe in detail the basis for the disagreement.

b. If Intervenor's disagree, describe any analyses, tests, prior experience or any other data which support Intervenor's position that simultaneous mechanical failures of components in more than one IHTS loop are credible.

c. Identify all documents which support Intervenor's response to this interrogatory.

Response

Without a better definition of what Applicants mean by the word "credible", Intervenor's cannot answer this question.

Interrogatory

10. State whether Intervenor's agree that excessive heat generation requires a reactivity insertion to the reactor.

a. If Intervenor's disagree, describe in detail the basis for the disagreement, including a description of any other causes of excessive heat generation.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors agree with this statement.

Interrogatory

11. State whether Intervenors agree that reactivity can be inserted in only two significant ways: (1) control rod withdrawal and (2) compaction of fuel geometry.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including a description of all other ways in which reactivity can be inserted.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree with this statement.

Interrogatory

12. State whether Intervenors agree that the bounding design basis accident which envelops all fuel movement resulting in excessive heat generation is the instantaneous insertion of the maximum possible reactivity from subassembly duct compaction.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including a description of any alternative design basis accident enveloping all fuel movement resulting in excessive heat generation.

b. Describe in detail all analyses, tests, prior experience or any other data which support Intervenors' alternative design basis accident.

c. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have no basis for disagreeing with Applicants' use of this event to define what Applicants refer to as the "bounding design basis accident..." Intervenors do not know precisely what events "subassembly duct compaction" is meant to encompass.

Interrogatory

13. State whether Intervenors agree that because the core former ring and fuel assembly ducts are passive devices located inside the reactor vessel, human interaction cannot modify or interfere with the behavior of these components during plant operation.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including the ways in which human interaction could modify or interfere with the behavior of these components.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors disagree with this statement. A CDA could be initiated through human error during reactor operation which could modify fuel assembly ducts.

Interrogatory

14. State whether Intervenors agree that all core-related accidents result from an imbalance between heat removal and heat generation.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including a description of any other ways in which accidents relating to the core could be caused.

b. Describe in detail any analyses, tests, prior experience or any other data which support Intervenors' alternative causes of core-related accidents.

c. Identify all documents which support Intervenors' response to this interrogatory.

Response

See response to Interrogatory 3 above.

Interrogatory

15. Identify and describe all initiators, sequences, and/or events not enveloped by Applicants' design basis accidents that Intervenors believe are: 1) credible and 2) could lead to reduced heat removal from the core or excess heat generation in the core.

a. Describe in detail the basis for any additional initiators, sequences, and/or events which Intervenors believe are credible and which could lead to reduced heat removal from the core or excess heat generation in the core.

b. As to each initiator, sequence, or event described above, state the basis for Intervenors' belief that such initiator, sequence or event is credible.

c. Identify and describe all analyses, tests, prior experience or any other data which support Intervenor's position that such additional initiator, sequence, or event is credible.

d. Identify all documents which support Intervenor's response to this interrogatory.

Response

CDAs.

a.-d. Initiators of CDAs are described in numerous documents by Applicants, Staff and other authors, e.g. CRBRP-1, and Walter and Reynolds, Fast Breeder Reactors.

Interrogatory

16. State whether Intervenor's agree that the following four (4) categories of design features are necessary and sufficient to prevent initiation of an hypothetical core disruptive accident (HCDA): (1) the reactor shutdown systems; (2) the shutdown heat removal systems; (3) means to prevent primary heat transport system (PHTS) pipe leaks larger than the design basis leak; and (4) features to prevent local imbalance between heat generation and heat removal.

a. If Intervenor's disagree, describe in detail the basis for the disagreement., including a description of any additional or alternative design features which Intervenor's believe are necessary to prevent initiation of an HCDA.

b. As to each design feature described above, describe in detail the HCDA initiator which the particular feature is meant to prevent.

c. Identify and describe any analyses, tests, prior experience or any other data which support Intervenor's response to this interrogatory.

d. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's disagree with this statement.

a.-d. See Intervenor's LWA-1 Testimony and Finding of Fact.

Interrogatory

17. State whether Intervenors agree that the reactor shutdown systems consist of two redundant, diverse, independent, fast-acting shutdown systems.

a. If Intervenors believe that the reactor shutdown systems are not redundant, describe in detail the basis for Intervenors' belief.

b. If Intervenors believe that the reactor shutdown systems are not diverse, describe in detail the basis for Intervenors' belief.

c. If Intervenors believe that the reactor shutdown systems are not independent, describe in detail the basis for Intervenors' belief.

d. If Intervenors believe that the reactor shutdown systems are not fast acting, describe in detail the basis for Intervenors' belief.

e. Describe in detail any criticisms which Intervenors have of the reactor shutdown systems designed for Clinch River.

f. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree that there are two fast-acting shutdown systems that have elements of redundancy, diversity and independence.

Interrogatory

18. State whether Intervenors agree that either of the reactor shutdown systems is capable of shutting down the reactor and preventing HCLD initiation, assuming any single failure within the operable system (including the assumption that the most reactive control rod in the operable system does not insert.)

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree that these are designed to meet the single failure criterion. Intervenors have no basis for concluding that systems will operate as intended.

Interrogatory

19. State whether Intervenors agree that the reactor shutdown systems rely on proven technology.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including a description of the technology which Intervenors believe is not already proven.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors disagree with this statement. The history of reactor shutdown systems is insufficient to "prove" that they will meet their intended performance goals.

Interrogatory

20. State whether Intervenors agree that any one of the four overall Shutdown Heat Removal Systems paths has the capability to independently reject the reactor decay heat.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree that this is a design objective within the performance limits of Applicants' DBA envelope definition.

Interrogatory

21. State whether Intervenors agree that anyone of the heat transport system paths in conjunction with the normal feedwater system or AFWS adequately removes reactor decay heat without the use for operator action.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors do not know, but presume this is the design objective.

Interrogatory

22. State whether Intervenors agree that the thermal centers of the reactor, the IHXs, the steam generators, and the protected air cooled condensers (PACCs) are at successively increasing elevations.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree with this statement.

Interrogatory

23. State whether Intervenors agree that by placing thermal centers of the heat exchanging components at successively increasing elevations in the plant, the three heat transport system paths can remove shutdown decay heat using natural circulation.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including a detailed description of the physical principles which would preclude natural circulation.

Response

Intervenors believe this is a necessary but not a sufficient condition.

Interrogatory

24. State whether Intervenors agree that by using the natural circulation capability, along with the turbine driven auxiliary feed water pump, battery-powered instrumentation and control, the shutdown heat removal system capability can be maintained even in the event of loss of all offsite power and loss of all three on-site diesel generators.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree that this is the design intent. However, it has not been demonstrated.

Interrogatory

25. State whether Intervenors agree that due to the high boiling point of sodium, the use of guard vessels around the primary heat transport system components and elevated piping outside the guard vessels, the Primary Heat Transport Systems (PHTS) design precludes loss of coolant from the core as the result of PHTS leaks and assures shutdown cooling even if leaks should occur.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors disagree with this statement. "Preclude" means "make impossible". As Applicants' own witnesses testified at the LWA-1 hearings, "anything is possible" if you discount the probability of its occurrence.

Interrogatory

26. State whether Intervenors agree that the core inlet design precludes the occurrence of an accident similar to that which occurred at Fermi.

a. If Intervenors disagree, describe in detail the basis for the disagreement, including a description of the sequence of events which could lead to a Fermi-type accident at CRBRP.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors disagree with this statement. "Preclude" means "make impossible". As Applicants own witnesses testified at the

LWA-1 hearings, "anything is possible" if you discount the probability of its occurrence.

Interrogatory

27. State whether Intervenor's agree that the direct heat removal system is capable of removing shutdown heat in the event the three heat transport system paths are simultaneously incapable of removing the shutdown heat.

a. If Intervenor's disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's agree that this is the design intent, assuming there is no common cause failure.

Interrogatory

28. State whether Intervenor's agree that the four shutdown heat removal system (SHRS) paths are redundant, diverse, and independent.

a. If Intervenor's disagree, describe in detail the basis for the disagreement that the four SHRS paths are redundant.

b. If Intervenor's disagree, describe in detail the basis for the disagreement that the four SHRS paths are diverse.

c. If Intervenor's disagree, describe in detail the basis for the disagreement that the four SHRS paths are independent.

d. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's agree that the four shutdown heat removal system paths have elements of redundancy, diversity and independence. The three primary loops are not diverse.

Interrogatory

29. State whether Intervenor agree that because the sodium coolant is maintained during operation at near atmospheric pressure, there is reduction of the internal force acting on the PHTS piping, thus reducing the mechanism that could cause a small piping flaw to grow to become a crack and cause a small crack to develop into a major leak.

a. If Intervenor disagree, describe in detail the basis for the disagreement. The response to this interrogatory must include a detailed description of the ways in which Intervenor believe a double-ended pipe rupture could occur.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor disagree with this statement. There is more than one physical phenomenon (or "mechanism") involved in crack growth. See the Harris report cited by Intervenor in our LWA-1 testimony.

Interrogatory

30. State whether Intervenor agree that due to the toughness and ductility of the PHTS stainless steel piping, if a large initial flaw were to exist, there would not be any significant growth of the flaw.

a. If Intervenor disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor can neither agree nor disagree with this statement, without a precise definition of what Applicants consider "significant".

Interrogatory

31. State whether Intervenor agree that the leak detection system monitoring the PHTS piping and the cells in which the piping is located can detect leaks as small as 100 grams per hour.

a. If Intervenor disagree, describe in detail the basis

for the disagreement.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors have no basis for agreeing or disagreeing with this statement at this time.

Interrogatory

32. State whether Intervenor agrees that if a small leak is not detected and corrective action taken, the toughness and ductility of the stainless steel piping, along with the low coolant operating pressure, would limit the maximum crack length and would not result in a double-ended pipe rupture.

a. If Intervenor disagrees, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors agree that this is the most probable outcome.

Interrogatory

33. Identify any instance of which Intervenor is aware of a double-ended pipe rupture in a nuclear power plant using a sodium coolant system.

a. As to any instance described above, identify the nuclear power plant which experienced a double-ended pipe rupture and describe the sequence of events which led to the double-ended pipe rupture and whether the double-ended pipe rupture resulted in any core damage.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors are not aware of any such instances.

Interrogatory

34. Describe in detail any local imbalance between heat generation and heat removal which Intervenor's believe could result in the initiation of an HCDA at CRBRP.

a. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's have nothing to add, at this time, to the discussions of this subject matter that appear in the PSAR, SER, SSR and our LWA-1 Testimony.

Interrogatory

35. Describe in detail the sequence of events other than an HCDA which Intervenor's believe could challenge the containment at CRBRP.

a. As to each sequence of events, describe in detail the controlling parameter (e.g., temperature, pressure).

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Loss of containment could occur through human intervention, e.g., operating the reactor in a manner not in accordance with proposed operating procedures.

Interrogatory

36. Describe all local fuel faults which Intervenor's believe could propagate to whole core involvement.

a. As to each local fuel fault identified above, describe in detail any previous experience in which such a local fuel fault propagated to whole core involvement.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors have nothing to add, at this time, to the discussions of this subject matter that appear in the PSAR, SER, SSR and our LWA-1 Testimony.

Interrogatory

37. State whether Intervenors agree that the control rods will react in sufficient time and with sufficient worth to achieve a balance between heat generation and heat removal.

a. If Intervenors disagree, describe in detail the basis for the disagreement.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors agree that this is the design objective.

Interrogatory

38. State whether Intervenors are aware of any initiators, sequences, or events not included in or enveloped by Applicants' design basis accidents other than HCTAs.

a. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors are aware of none.

Interrogatory

39. Describe in detail any inadequacies in Applicants' analysis of core meltthrough following loss of core geometry.

a. Describe any analyses, tests, prior experience or any other data of which Intervenors are aware which demonstrate that Applicants' analysis is inadequate.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Our primary objection, as indicated in our LWA-1 testimony, is Applicants' failure to treat CDAs as a containment design basis accident and, consequently, Applicants' use of "best estimate" rather than conservative assumptions in the analysis.

Interrogatory

40. Describe in detail any inadequacies in Applicants' analysis of the ways in which human error can initiate, exacerbate, or interfere with the mitigation of CBERP accidents.
- a. Identify and describe in detail all human errors which can initiate accidents at CBERP and which have not been adequately analyzed by Applicants.
 - b. Identify and describe in detail all human errors which can exacerbate accidents at CBERP which have not been adequately analyzed by Applicants.
 - c. Identify all human errors which can interfere with the mitigation of accidents at CBERP which Applicants have not adequately analyzed.
 - d. Identify all documents which support Intervenor's response to this interrogatory.

Response

See our LWA-1 testimony.

Interrogatory

41. Define the term "reliable data" as used in Intervenor's Contention 1.a.

Response

"Reliable data" means "suitable factual information capable of being used to predict meaningful useful results."

Interrogatory

42. Define the term "sufficiently low" as used in Intervenor's Contention 1.a.

Response

"Sufficiently low" means "quantitatively small enough."

Interrogatory

43. Identify and describe all analyses, statements and conclusions contained in Appendix A of the SER with which Intervenor's are in disagreement. The response to this interrogatory must include a detailed description or explanation of all bases for Intervenor's disagreement.

a. As to each such analysis, statement, or conclusion, describe all analyses performed by Intervenor's which support Intervenor's position.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's basic position with regard to Staff's CRBR accident analysis regarding Contention 1, 2 and 3 are set forth in our LWA-1 Testimony, and Proposed Findings of Fact and Conclusions of Law and in the Contentions themselves. Intervenor's have not had time to make a line-by-line analysis of Appendix A of the SER and do not intend to conduct such a research effort, but will continue to rely on it as reference document as the need arises.

Interrogatory

44. Identify and describe in detail all analyses, statements, and conclusions contained in CRBRP 3, Vol. 1 and Vol. 2 with which Intervenor's are in disagreement. The response to this interrogatory must include a detailed description or explanation of all bases for Intervenor's disagreement.

a. As to each such analysis, statement, or conclusion, describe all analyses performed by Intervenor's which support Intervenor's position.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's basic position with regard to Applicant's CRBR accident analysis regarding Contention 1, 2 and 3 are set forth in our LWA-1 Testimony, Proposed Findings of Fact and Conclusions of Law and in the Contentions themselves. Intervenor's have not had time to make a line-by-line analysis of CRBRP 3, Volumes 1 and 2 and do not intend to conduct such a research effort, but will continue to rely on CRBRP 3, Volumes 1 and 2 as the need arises.

Interrogatory

45. Identify all models and computer codes used by Applicant's in their analysis of CDAs and their consequences which Intervenor's believe have not been adequately documented.

a. As to each computer code identified above, describe in detail the additional categories of the documentation which Intervenor's believe would be sufficient.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

46. Identify all models and computer codes used by Applicant's in their analysis of CDAs and their consequences which Intervenor's believe have not been adequately verified.

a. Describe in detail the additional experimental data which Intervenor's believe are necessary to verify the model or computer codes.

b. Identify all documents which support Intervenor's

response to this interrogatory.

Response

Intervenors have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

47. Identify all models and computer codes used by Applicants in their analysis of CDAs and their consequences which Intervenors believe have not been adequately validated.

a. Describe in detail the additional experimental data which Intervenors believe are necessary to validate the models and/or computer codes.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

48. Describe in detail the basis for Intervenors' statement in Contention 2.f) that "Applicant's and Staff's safety analyses did not establish that the models accurately represent the physical phenomena and principles which control the response of a CRBR to CDAs".

a. Describe the precise "physical phenomena" referred to in Intervenors' Contention 2.f).

b. Describe the precise "principles" referred to in Intervenors' Contention 2.f).

c. Identify all documents which support Intervenors' contention that the models do not accurately represent the physical phenomena and principles which control the response of CRBR to CDAs.

d. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

49. Identify and describe in detail all input data for the computer models and codes used by Applicants which Intervenors believe are not adequately documented.

a. Describe in detail the additional documentation which Intervenors believe is necessary.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

50. Describe in detail the assumptions for the computer models and codes which Intervenors believe are not adequately documented.

a. Describe in detail the additional documentation which Intervenors believe is necessary.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

51. Identify all input data for the computer models and codes used by Applicants which Intervenors believe are not adequately verified.

a. Describe in detail the additional data necessary to verify the input data.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors have not completed their analysis and at this time have nothing to add to their LWA-1 testimony in this regard.

Interrogatory

52. State whether Intervenors agree that the coolant boundary can withstand dynamic loads equivalent to an energetic release of 661 MJ's.

a. If Intervenors disagree, describe in detail the basis for the disagreement. The answer to this interrogatory must include a detailed description of the accident sequence which would successfully challenge the coolant boundary at 661 MJ's or less.

b. Identify all analyses, tests, or any other data which support Intervenors' response to this interrogatory.

c. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors can neither agree nor disagree with this statement, since they have not completed their analysis of the SER.

Interrogatory

53. Identify and describe all sodium/concrete interactions as noted in contention 3.c) which Intervenors believe have not been adequately analyzed.

a. Describe in detail the basis for the contention.

b. Identify all documents which support Intervenors' response to this interrogatory.

Response

See Appendix A of the SER.

Interrogatory

54. State whether Intervenors believe that a loss-of-flow (LOF) accident will result in an energetic event.

a. If so, provide the precise sequence of events which will occur during the initiation of such an accident.

b. If so, describe the precise sequence of events which will occur during the meltout phase of the accident.

c. If so, describe the precise sequence of events which

will occur during the pool phase of the accident.

d. Describe all analyses, tests, or any other data which support Intervenors' response to this interrogatory.

e. Identify all documents which support Intervenors' response to this interrogatory.

Response

This event is a function of probability. Intervenors have not conducted an independent analysis of the LOF accident, but rely on analyses conducted by the Staff and Applicants and their consultants. Intervenors have not completed their analysis of the SER in this regard.

Interrogatory

55. State whether Intervenors believe that a transient over power (TOP) accident will result in an energetic event.

a. If so, describe the precise sequence of events of such an accident during the initiation phase.

b. If so, describe the precise sequence of events which will occur during the meltout phase of such an accident.

c. If so, describe the precise sequence of events which will occur during the pool phase of such an accident.

d. Identify all analyses, tests, or any other data which support Intervenors' response to this interrogatory

e. Identify all documents which support Intervenors' response to this interrogatory.

Response

Intervenors' answer regarding TOP accidents is the same as their answer regarding LOF accidents in Interrogatory 54 above.

Interrogatory

56. Other than an LOF or TOP accident, are Intervenors aware of any other accident sequence which could potentially result in an energetic event?

- a. If so, describe the precise sequence of events which will occur during the initiation phase of such an accident.
- b. If so, describe the precise sequence of events during the meltout phase of such an accident.
- c. If so, describe the precise sequence of events during the pool phase of such an accident.
- d. Identify all analyses, tests, or any other data which support Intervenor's response to this interrogatory.
- e. Identify all documents which support Intervenor's response to this interrogatory.

Response

Recriticality events, if they are not treated as part of the LOF or TOP sequences. See Answer 54.

Interrogatory

57. Identify any structural data and/or analyses contained in CRBRP 3 Vol. 1, with which Intervenor's disagree.
- a. As to any such data or analysis identified above, describe in detail the basis for Intervenor's disagreement.
 - b. Identify any analyses, tests, or any other data which support Intervenor's position.
 - c. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenor's are not aware of any at this time other than the Staff analysis in the SER.

Interrogatory

58. State whether Intervenor's agree that, assuming no failure of containment during the initiating phase of an HCDA, containment integrity without venting would be maintained for more than a day following penetration of the reactor vessel and guard vessel.
- a. If Intervenor's disagree, describe in detail the basis for this disagreement. The answer to this interrogatory must include a detailed description of the sequence of events which would lead to a failure of containment integrity after the initiating phase of the accident.
 - b. Identify and describe in detail all analyses, tests, or any other data which support Intervenor's position.

c. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors do not believe the data provided in the SER supports a conclusion that one can rely on containment integrity for 24 hours.

Interrogatory

59. State whether Intervenor's agree that, assuming no failure of containment during the initiating phase of an HCDA, containment capability above the base mat would be maintained indefinitely by controlled venting and purging.

a. If Intervenor's disagree, describe in detail the basis for the disagreement. The response to this Interrogatory must include a detailed description of the sequence of events which would lead to the failure of containment integrity.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

Whether containment integrity would be maintained through venting will depend on several important factors, including operator training, the quality of instrumentation, construction quality control, and the confidence one places in the prediction of the containment capability and the physical phenomena inside the reactor cavity and containment following meltthrough.

Interrogatory

60. State whether Intervenor's disagree with any of the equipment qualification requirements described in CRBRP III, Volume 2.

a. If so, describe in detail the basis for Intervenor's disagreement.

b. Describe any alternative requirements which Intervenor's believe should be adopted and the basis for the alternative.

c. Identify all documents which support Intervenor's response to this interrogatory.

Response

Intervenors have not performed such an analysis. See Answer 39. Intervenor's believe if a CDA were treated as a containment DBA, more stringent requirements would be imposed, including, for example, adoption of the single-failure criterion for containment safety systems.

Interrogatory

61. State whether Intervenor's believe that any of the features of the Applicants' thermal margin beyond design base clean-up system are inadequate.

a. If so, identify the precise features which Intervenor's believe are inadequate and describe in detail the basis for Intervenor's position.

b. Identify and describe any alternative features which Intervenor's believe should be incorporated in Clinch River in order to accommodate thermal margins beyond the design base accidents and state the basis for such alternatives.

c. Identify all documents which support Intervenor's response to this interrogatory.

Response

Yes. See Answer 39 above.

Interrogatory

62. Describe in detail any criticisms which Intervenor's have of Applicants' analysis of HCDA energetics.

a. As to any criticism identified above, identify and describe any analyses, tests, prior experience, or any other data which support Intervenor's criticism.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

See Answer 39.

Interrogatory

63. Describe in detail any criticism which Intervenor has of Applicants' analysis of sodium concrete reaction contained in CRBRP III, Vol. 2.

a. As to any such criticism, identify and describe any analyses, tests, prior experience, or any other data which support Intervenor's criticism.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

See Answer 39 and the SER.

Interrogatory

64. Describe in detail any criticisms which Intervenor has of Applicants' analysis of the radiological consequences resulting from an HCTA at CRBRP contained in CRBRP 3, Vol. 2.

a. As to any such criticism, identify and describe in detail any analyses, tests, prior experience, or any other data which support Intervenor's criticism.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

These were set forth in our LWA-1 testimony.

Interrogatory

65. Describe any criticisms which Intervenor has of Applicants' aerosol behavior calculations contained in CRBRP 3 Vol. 2.

a. As to any such criticism, identify and describe in detail any analyses, tests, prior experience, or any other data which support Intervenor's criticism.

b. Identify all documents which support Intervenor's response to this interrogatory.

Response

See Answers 39 and 64.

Interrogatory

66. Describe the term "environmental conditions" as used in

Intervenors Contention 10.

a. Describe the precise environmental conditions which Intervenors believe will prevent the CRBRP from maintaining safe cold shut-down and containment integrity.

Response

Intervenors hereby withdraw Contention 10. Any remaining concerns we have in this regard are adequately covered by Contentions 1, 2 and 3.

Interrogatory

67. Identify any experts Intervenors intend to call as witnesses in support of Contentions 1, 2, 3.

a. As to each such expert, provide the following information: (1) educational background; (2) employment background; (3) a listing of all hearings in which the expert has testified as a witness concerning accident analysis of nuclear power plants; (4) a listing of all articles, books, studies or other documents prepared by the expert on accident analysis at nuclear power plants.

Response

Undecided.

Interrogatory

68. With regard to Dr. Thomas Cochoran, provide the information requested in Interrogatory 66.

Response

This question makes no sense, even assuming the correct spelling of "Cochran".

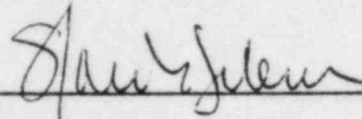
Interrogatory

69. Identify all documents which Intervenors intend to introduce into evidence at the construction permit hearings.

Response

Intervenors have not decided.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Barbara A. Finamore", is written over a horizontal line.

Barbara A. Finamore
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