UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	Docket No. 50-142
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	)	(Proposed Renewal of Facility License Number R-71)
	)	
(UCLA Research Reactor)	)	
	)	

INTERVENOR'S INTERROGATORIES TO APPLICANT, THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Dated: April 20, 1981

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COMMITTEE TO BRIDGE THE GAP

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TO: THE REGENTS OF THE UNIVERSITY OF CALIFORNIA AND THEIR ATTORNEYS OF RECORD, GLENN R. WOODS AND CHRISTINE HELWICK.

Intervenor, COMMITTEE TO BRIDGE THE GAP, hereby requests that said Applicant answer the following interrogatories fully and separately under oath, pursuant to the stipulated discovery schedule in this action.

It is intended by this set of interrogatories to elicit information not merely within your own personal knowledge, but obtainable on your behalf, such as by your attorneys, employees,

investigators and representatives. Wherever the term "you" is used, it refers to you or anyone acting on your behalf including your attorneys, investigators, representatives and employees.

Definition of Terms Used in Interrogatories

In answering the following interrogatories, understand the following terms used in the interrogatories to mean as follows:

"Applicant" - The Regents of the University of California.

"Application" - Applicant's "Application for a Class 104 License for a Research Facility" submitted February 28, 1980.

"NRC" - The United States Nuclear Regulatory Commission.

"Intervenor" - The Committee to Bridge the Gap.

"the reactor" - The UCLA research reactor, License No. R-71, docket 50-142.

"current Technical Specifications" - The Technical Specifications of the UCLA reactor currently in force.

"proposed Technical Specifications" - The Technical Specifications of the UCLA reactor proposed in the Application.

"controls" - "when used with respect to a nuclear reactor means apparatus and mechanisms the manipulation of which directly affect the reactivity or power level of the reactor"

"operator" - Any individual who manipulates a control of a facility. An individual is deemed to manipulate a control if he directs another to manipulate a control [10 CFR 55.4(d)]. Intervenor hereby for the purpose of these interrogatories specifies that if one individual directs another to manipulate a control and that second individual does manipulate the controls, both individuals are deemed to manipulate the controls and thus both are considered operators.

"senior operator" - Any individual designated by a facility license under 10 CFR 50 (in this case, the Applicant) to direct the licensed activities of licensed operators [10 CFR 55.4(e)]. Intervenor hereby for the purpose of these interrogatories defines "direct the licensed activities of licensed operators" to not include directing the activities of unlicensed operators except students in an engineering course, or operator license trainees as exempted under 10 CFR 55.9.

"Students in a nuclear engineering class" - Students formally enrolled, for credit and to be evaluated by an instructor, in a formal course in nuclear engineering offered by an accredited institution of learning. For the purposes of these interrogatories, students in a general science class, for example a high school physics class, would not be considered students in a nuclear engineering class. Likewise, people who visit the facility on a tour would not be considered "students in a nuclear engineering class" unless they were receiving academic credit from an accredited institution of learning in a course in nuclear engineering and the tour was a formal part of that nuclear engineering course.

"Operator trainees" - An individual in a formal training program to qualify as a licensed reactor operator.

"Commercial use" - Use of the reactor, for which a fee is paid to the NEL or Applicant, by persons other than those officially associated with UCLA, other colleges and universities, or other non-profit organizations. In particular, use of the reactor by persons described as commercial users by the Applicant in Applicant's response of May 13, 1980, to an NRC information request of April 17, 1980.

"Person" - A natural person, a corporation, a partnership, an association, or any other similar type of entity.

"Document" - Any printed, typewritten, or handwritten matter of whatever character, including, but not limited to, logs, minutes, computer printouts, contracts, data records, leases, diaries, letters, ledgers, memoranda, telegrams, statements of witnesses or persons having knowledge of relevant facts, catalogs, brochures, checks and check stubs, invoices, vouchers, orders, any carbon or photographic copy of any such material, and any magnetic, mechanical, or electrical recording.

Intervenor has for purposes of clarity in these interrogatories defined with specificity the terms it has used so that Applicant can know specifically what information is being sought. None of the above definitions should be considered definitions which Applicant, by answering the interrogatories that follow, has in any fashion indicated agreement with. If Applicant disagrees with the definitions herein, Applicant should so state, but should nevertheless answer the interrogatories according to the definitions above and thereafter give Applicant's definitions of these terms and answer the same questions using Applicant's definitions.

GENERAL PROVISIONS

The following general provisions apply to each interrogatory herein:

A. In answering these interrogatories, furnish all information available to Applicant, including information in possession of your attorneys, investigators, agents, employees, and

such other persons and not merely such information as is known personally to the individual or individuals primarily responsible for drafting the answers.

B. If Applicant cannot answer any of the following interrogatories in full, after exercising due diligence to secure the information to do so, so state, and answer to the extent possible specifying your inability to answer the remainder, and stating whatever information or knowledge you may have concerning the unanswered portion.

C. With respect to each of your answers which identifies a document, you may attach a copy of such document to your answers to these interrogatories in lieu of describing such document and the contents thereof.

D. If an answer to these interrogatories includes a reference to an oral communication, please state with respect thereto:

(1) The date and place of communication;

(2) The identity of each person participating and/or present during each oral communication;

(3) The substance of what was said by each person who participated in each discussion;

(4) If a written record was made of the communication, please identify each document as hereinafter set forth; and

(5) If any magnetic, mechanical, or electrical recording was made of the communication, identify the nature of same and the name of the person who has custody of same.

E. If you are asked to identify a document please state with respect to each such document:

(1) The identity of the person who signed it or in whose name is was signed;

(2) The identity of the person(s) who prepared the documents if different from the person(s) signing the document;

(3) The identity of the person or persons to whom it was addressed;

(4) State the nature and substance of the document;

(5) State the date the document was executed if different from the date it bears; and

(6) If the document or copy of it is not in your control or custody, state the identity and most recent known address of the person or entity who has custody or control of it.

F. If you are asked to identify a person, please state with respect to each such person:

(1) Full name by which the person is known;

(2) Last known home address;

(3) Last known business address;

(4) Last known home telephone number;

(5) Last known business telephone number;

(6) Name and address of the person's employer; and

(7) Relationship to plaintiff.

G. In answering interrogatories dealing with matters prior to 1975, furnish all information available to those persons who now employed by or otherwise associated with the University of California who might have knowledge of pre-1975 NEL matters, including but not limited to Tony Zane, Charles Ashbaugh III, Jack Hornor, and William Kastenberg.

H. In determing which employees of the Applicant may have information related to these interrogatories, include not only current employees of NEL (including but not limited to Neill Ostrander, Tony Zane, Charles Ashbaugh III, and Jack Hornor) and past and present NEL Directors Ivan Catton and William Kastenberg, but also all other persons known by your attorneys and principal NEL personnel to have knowledge relevant to the interrogatories asked, be they presently associated with University of California facilities at UCLA, Berkely, Davis, Riverside, Santa Barbara, Los Alamos, Livermore, or any other facility operated or managed by the Applicant, the Regents of the University of California.

I. Contentions are referred to herein by the Roman numeral by which they were identified in Attachments A, B, and C of the stipulation between parties of December 1, 1980.

J. You are required to supplement your answers to these interrogatories in accordance with the provisions of 10 CFR 2.740(e).

K. Interrogatories are divided herein by the contention to which they primarily relate, although interrogatories will often relate to more than one contention.

Dated: April 20, 1981

Mark S. Pollock
Attorney for Intervenors
COMMITTEE TO BRIDGE THE GAP

INTERROGATORIES AS TO CONTENTION I

"Application Inadequate"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Has the person (s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person(s), other than the Applicant's attorneys furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

   a. Please identify each and every such person.
   b. Please state the number of each interrogatory with respect to which that person was consulted.
   c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of answers to these interrogatories.

3. On what date, or approximate date, did the preparation of the Application For Renewal Of Operating License For UCLA Research Reactor (Application) begin?

4. State the name and title of the highest ranking university employee responsible for preparing the Application.

5. Approximately how many hours per month did the senior university employee responsible for preparing the Application spend in preparing the Application? How many months did this person devote to such preparation?

6. Was the highest ranking university employee responsible for preparing the Application assisted by consultants or contractors from outside the UCLA NEL? If so, please give the names and addresses of such consultants or contractors and specify the nature of tasks that each consultant or contractor was employed to perform. And, if compensation was paid for such tasks, for how many hours of work was each consultant or contractor compensated?

7. Identify the UCLA NEL employees, by name and title, who assisted the highest ranking university employee responsible for preparing the Application. Specify the responsibility each employee assumed in preparing the Application and the total number of hours each such employee devoted to the preparation of the Application. Also specify the time interval during which each such employee was involved in the process of perparing the Application.

8. Identify all studies, if any, performed specifically to support the preparation of the Application and the dates during which these studies, if any, were performed.

a. Will these studies, if any, be provided to the

intervenor absent a formal motion to produce?

9. When was the first draft of the Application completed? How many drafts of the Application were prepared before the Application was submitted to the NRC?

10. Identify the university employee who assumed responsibility for reviewing the accuracy and completeness of the Application once the first draft was completed.

a. How many hours per month did this university employee devote to reviewing the Application?

b. Identify the major changes, other than spelling, grammar, and sentence structure, made in the Application as a result of this review process.

c. How much total time was spent in such review?

11. Are significant parts of the 1980 Safety Analysis Report (SAR) included in the Application virtually verbatim repitition of the 1960 Hazards Analysis? If so,

a. What studies, if any, were conducted during the preparation of the Application to assure the continued validity of the 1960 SAR?

b. If no studies were done, how does the Applicant justify the failure to prepare new information?

12. What changes were made in the 1960 SAR in the process of incorporating it into the 1980 SAR?

13. Who was responsible for the preparation of the 1980 SAR? How many total hours did this person devote to the preparation of the 1980 SAR?

14. a. Do substantial portions of the 1960 HAZARDS ANALYSIS constitute virtual verbatim copies of substantial portions of the University of Florida's research reactor's HAZARDS ANALYSIS?

b. If not, was the 1960 SAR substantially derived from the University of Floridas research reactor?

c. If either a. or b. is affirmative, on what basis does the Applicant assert that the U. of F. HAZARDS ANALYSIS is applicable to UCLA's facility?

15. Do pages II/3-1 through II/7-1 of the Environmental Impact Appraisal included in the Application contain a virtual verbatim copy of the language contained in the 1974 AEC memorandum on "Environmental Considerations Regarding the Licensing of Research Reactors and Critical Facilities?"

a. If so, what investigations or studies, if any, were performed to assure the validity of the substance of this memorandum in its specific application to the UCLA Research Reactor?

b. If the University asserts that the above-mentioned section of the Environmental Impact Appraisal does not contain a virtual verbatim copy of this AEC memorandum, what studies, investigations, or documents were relied upon by the University in the preparation of these parts of the Environmental Impact Appraisal?

16. Will the university make available to intervenors the studies, investigations or documents referred to in interrogatory 15. absent a formal motion to produce, identifying

the persons responsible for these studies and investigations and giving the dates when the studies and investigations were performed?

17. a. Is the statement quoted from page five of the Application by contention I (3) (a) an accurate representation of the use to which the reactor facility will be put?

b. Is the information asserted by this statement material to the university's justification of the need for a renewed license to continue operating the reactor?

c. Identify the factual basis for the answers to a. and b. above.

d. What academic courses require the use of the reactor?

e. How many students have been enrolled in each of these classes for each of the last five years?

f. For each course, how many times during the course is the reactor operated?

g. How many hours of reactor operation during each course are actually spent?

h. Have any of these courses ever been taught without using the reactor either because the reactor was down when it should have been used or because the instructor chose not to use the reactor?

i. If the answer to h. above is affirmative, detail each such instance.

j. Which courses could not be taught without the reactor?

18. How many graduate students currently depend upon the reactor for all or part of their research study?

a. Identify these students and the projects they are involved in which require the use of the reactor.

b. How many hours of reactor use are required for each of these projects?

c. Would it be feasible for these students to use other facilities--for example, the research reactor at UC Irvine?

d. If not, why not?

19. Is the statement quoted from page seven of the Application by Contention I (3) (6) accurate?

a. What factual basis does the university have to support this assertion?

b. Is the structural soundness of the reactor material to the university's justification of the need to renew the license?

c. What efforts has the university made to identify structural weaknesses in the reactor?

d. Is the statement meant to indicate that the university is asserting that the reactor has no structural weakness?

e. If the answer to d. is affirmative, what studies or analysis have been performed to support that assertion?

f. Will these studies or analysis, if any, be made available to intervenor absent formal motion to produce?

g. Who performed these studies or analysis?

h. Over what period of time were these studies or analysis conducted?

20. Is the statement quoted in Contention I (3) (c) from page V-1 of the Application accurate?

a. If so, what is the basis for the assertion?

b. Does the university assert that 2.3% $\Delta k/k$ represents a reactivity level identical to $3.54?

c. If the answer to b. above is accurate, identify any analysis performed to substantiate this assertion.

d. Will this analysis be made available to intervenor absent a formal motion to produce?

21. Does the Application have the effect of proposing to change the definition of the word "annual" for the purpose of instrument calibration requirements?

a. Is the reliability of such instrument calibration relevant to the safety of the reactor?

b. Can calibration at too long an interval affect instrument reliability at NEL?

c. What is the purpose of extending the calibration period from twelve to fourteen months?

d. If there is no purpose, does the university object to allowing the period to be twelve months to conform with the conventional definition of "annual?"

e. If the answer to d. above is negative, why does the university object?

f. On what basis is either twelve or fourteen months felt to be adequate?

22. Has the specific requirement for the heat balance instrument calibration been removed from the proposed reactor technical specifications?

a. If so, how does the university justify this removal?

b. What reliance is there on the accuracy of the instrumentation for which the heat balance is done?

c. If accuracy is not relied upon, what purpose does the heat balance instrumentation now serve?

d. If accuracy is relied upon, how does the university justify elimination of the calibration requirement, if such requirement has been eliminated?

e. What analysis or studies have been conducted to support the answers to the above questions?

f. Will these analysis or studies be made available to intervenor absent formal motion to produce?

23. Has the written statement of the ALARA requirements been removed from the proposed technical specifications?

a. If so, what justification can the university provide to support this removal?

b. Were the ALARA requirements ever germaine to the reactor technical specifications?

24. Are the requirements for

a. exhaust stack height,

b. flow rate out of the exhaust stack (as opposed to capability of exhaust fans), and/or

c. access restrictions to the roof area

included in the proposed technical specifications?

d. If any of the requirements have been removed, how is such removal justified?

e. Identify the original purpose for each of these three requirements.

f. How are the purposes satisfied in the Technical Specifications submitted with the Application?

g. If no such provisions are made in the Application's proposed Technical Specifications, what studies have been performed to determine that such requirements are no longer necessary?

h. Identify the author, title, and subject of each such study and indicate whether each will be made available to intervenor absent a formal motion to produce.

25. Is the assertion that no deep wells have been drilled on the campus of UCLA or in the vicinity of the campus accurate?

a. What data were reviewed in preparation of the Application to ascertain the accuracy of the statement?

b. What hydrolic studies have been performed or reviewed to determine that no nearby aquifer is capable of being influenced by an accident or spillage of radioactive material at the UCLA research reactor?

c. Please identify the sources of data, the names of of researchers, and the dates of data search or study performance for all data reviewed or studied mentioned in the answer to the above questions in this interrogatory.

d. Will these data and studies be released to intervenor absent a formal motion to produce?

26. Is the statement quoted in Contention I (3) (e) from page II/3-1 of the Application accurate?

a. If it is asserted by the university to be accurate, was the conclusion arrived at independently through independent university/NEL studies or was it taken directly from the 1974 AEC memorandum on "Environmental Considerations Regarding the Licensing of Research Reactors and Critical Facilities?

b. If arrived at independently, identify the independent study or studies done to support the conclusion. Provide the author, title, and date of study and indicate whether the study or studies will be made available to intervenor absent a formal motion to produce.

c. If no such independent study was performed, on what basis does the Applicant contend the statements to be applicable to the UCLA reactor?

d. In answering question c. above, please indicate precisely what the Applicant considers to be the "largest core damage and fission products release" possible, what 10CFR Part 100 guidelines are considered to either apply or to be relevant for comparison purposes, and how extensive an environmental impact is considered by the university to be negligible.

e. Indicate all analysis and studies which have been performed that either support or contradict the conclusion asserted in each aspect of the quoted

statement. Provide author, titles, and dates of study for each such analysis or study and indicate whether they will be provided to intervenor absent a formal motion to produce.

27. What alternatives have been analyzed or considered in any way as a basis for the statement quoted in Contention I (3) (f) from page II/5-1 of the Application?

a. Did the university analyze the possibility of using the research reactor at U.C. Irvine or any other existing reactor as a substitute for the campus reactor?

b. How many trips to Irvine or another reactor would be required if this alternative was accepted?

c. Describe the analysis performed on the various alternatives considered to determine whether each alternative was economical.

d. Will Applicant supply these analysis to intervenor absent a formal motion to produce?

e. What are the "educational and research objectives of of the facility" as referenced in the quoted statement?

28. Is the statement quoted in Contention I (3) (g) from page V/3-6 of the Application accurate?

a. What relevances have this statement to the UCLA Argonaut reactor?

b. Has the Applicant undertaken any study to assess the correlation, if any, between SPERT, BORAX, and Argonaut reactor experience?

c. If the answer to b. is affirmative, what is the correlation?

d. Will the university supply these studies to intervenor absent a formal motion to produce?

e. What specific SPERT and BORAX tests does the quoted statement refer to?

f. Do these tests provide direct data supporting the quoted statements or has some inference been made to arrive at the quoted statements?

g. If by inference, what is the inference and how is it justified?

h. Describe the similarities and differences between the SPERT and BORAX tests referred to and the UCLA reactor.

i. Do these differences in any way reduce the relevancy of the SPERT and BORAX tests to the UCLA reactor?

j. If the answer to i. above is negative, why not?

k. Identify all studies, articles, reports, documents or data that support Applicant's statement on page V/3-6 of Application. Will Applicant produce these absent a formal motion to produce?

INTERROGATORIES AS TO CONTENTION II

"Wrong Class License"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

(a) Please identify each and every such person.

(b) Please state the number and each interrogatory with respect to which that person was consulted.

(c) Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Please describe in detail what programs and functions are performed by NEL and its employees other than those

related to the Reactor; including but not limited to a description of:

(a) Duties of the director other than those related to the Reactor.

(b) Duties of the manager other than those related to the Reactor.

(c) Duties of the secretary other than those related to the Reactor.

4. Are supplies and expenses for the Reactor operation accounted for separate of similar supplies and expenses for other functions of the NEL?

(a) If not, how were the figures regarding the allocation of NEL expenses an supplies to the Reactor operation listed on Page I/2-1 of the Application arrived at?

5. Please identify all academic reviews of the NEL or the Reactor program which have been conducted during the current operating license period.

(a) Will you produce these documents without a formal motion to produce?

6. Please identify any and all letters, reviews or other documents which contain recommendations to the Dean of the School of Engineering and Applied Sciences (SEAS) concerning the financial support of the Reactor program.

(a) Will you produce these documents without a formal motion to produce?

7. Please describe in detail the process whereby the final budget appropriation for the NEL and/or the Reactor program is determined; including but not limited to the identification of:

(a) Who prepares the initial budget request?

(b) Who reviews the initial budget request?

(c) Who makes the final budget appropriation decision.

8. Please identify any and all documents used in the budgetary process.

(a) Will you produce these documents without a formal motion to produce?

9. Has the NEL's final budget appropriation ever been less than the initial budget appropriation request.

(a) If so, for each year from 1960 to 1981 for which there was such a shortfall please indicate what factors caused or required the decision to reduce the appropriation to below the level of the initial budget request.

(b) Please identify for each year any and all documents which would tend to support the existence of the facts or decisions identified in the answer to the previous question.

(c) Will you produce these documents without a formal motion to produce?

10. How is the programmatic need for the Reactor program within the University determined?

11. Many of the Interrogatories 8 through 29 pertain to Reactor run #2596, on April 10, 1980, logged on Pages 267-269 of the Operating Log A-I. For run 2596 Kalil was listed as the user. Please define the term user as it is used in the operating log.

12. On run 2596 did Kalil actually operate the reactor?

13. Does Kalil ever operate the reactor?

14. Does the user ever operate the reactor?

15. Did Kalil actually conduct the experiments on run 2596?

16. Does Kalil ever actually conduct the experiments?

17. Does the user ever actually conduct the experiments?

18. If the user does not operate the reactor or conduct the experiments, please identify the individuals who would operate the reactor and conduct the experiments.

(a) Do these persons get paid by the NEL? The user?

19. How does the user acquire the operating time of the reactor?

20. Is Kalil directly connected to the NEL?

21. Is Uranium West Labs connected to the NEL?

22. Did Kalil or Uranium West Labs acquire reactor operating time on April 10, 1980?

(a) If not, how would Applicant describe the process which led to the NEL running an experiment for Kalil?

23. Was Kalil or Uranium West Labs billed for the port hours used on April 10, 1980?

(a) If so, at what rate?

(b) How was the billing rate determined?

24. What relationship does the billing rate have to the actual cost of operating the reactor?

25. Please identify any and all reports, calculations or other documents relating the determination of the standard hourly reactor rental rate.

(a) Will you produce these documents without a formal motion to produce?

26. During run 2596 were student operators involved in the run?

(a) If so please describe the student operator's duties and responsiblities.

(b) If so, did the student operators receive academic credit for their services?

27. Are student operators ever involved when the reactor is run solely or partially for a user who is paying a fee for his use of the reactor?

(a) If so please describe the studert operator's duties and responsiblities.

(b) If so, do student operators receive academic credit for such services?

28. Are students ever involved in rendering technical assistance when the reactor is run solely or partially for a user who is paying a fee for his use of the reactor?

(a) If so, please describe the technical assistance rendered by the students.

(b) If so, do the students receive academic credit for their services rendered?

29. During run 2596 were students involved in rendering technical assistance in the operation of the reactor or the conduct of the experiment?

(a) If so, were the students paid for their services?

(b) If so, please describe in detail what services, jobs, and functions the students performed and rendered.

(c) If so, did any of the students receive academic credit for their services?

30. For each answer to Interrogatories 26.b, 27.b, 28.b, and 29.c for which the answer was affirmative, please indicate the course number and name under which the credit was received, and identify the instructor responsible for the course.

31. If the students rendering technical assistance are not recieving credit for their services, does the Applicant claim that their work at the reactor is part of the reactor program's educational function?

(a) If so, on what basis is this claim made?

37. To the best of Applicant's knowledge, is there an official definition of education within the University of California?

(a) If so, what is the definition and in what document(s) is it found?

(b) Will you produce said document(s) without a formal motion to produce?

33. Is reactor operating time required for any degree granted by the SEAS?

(a) If so, for which degree?

34. Is the rendering of technical services at the reactor required for any degree granted by the SEAS?

(a) If so, for which degree?

35. Which engineering classes use the reactor as part of the regular course curriculum?

(a) For each course listed in answer to Interrogatory No. 35 please indicate the number of students enrolled in each class each year for which Applicant has records.

(b) In which of the courses listed above to the students actually operate the reactor?

(c) In which of the courses listed above did the students conduct original research using the reactor?

(d) For each class listed above in which students do not actually operate the reactor or conduct original research please describe the use to which the reactor is put as part of the curriculum.

36. If the reactor were not relicensed, which of the courses listed in answer to Interrogatory No. 35 would no longer be offered?

(a) Which classes could no longer be offered?

37. Which of the courses listed in answer to Interrogatory No. 35 could utilize nuclear reactor facilities other than UCLA-NEL as part of the course curriculm?

(a) For any class which could not utilize other facilities please explain in detail why other facilities could not be used.

38. Is the training of reactor operators done in conjunction with any academic program?

(a) If so, please identify the program, specify the degree to which it leads, and identify the courses under which credit would be received for training activities.

39. Please describe any activities undertaken by students at NEL for which academic credit is received, which are not described in the answers to Interrogatories 35, 36 and 37.

(a) For each activity listed above, identify the course number under which academic credit is received and the degree to which it might lead.

40. Please describe any and all activities undertaken by students at NEL for which academic credit is not received.

(a) For each activity listed above indicate whether students are paid for their services.

(b) If they are paid for their services indicate by whom they are paid.

41. For (A) the year 1980 and (B) January 1, 1981 through the present, please indicate reactor usage in port hours for each of the following activities as defined by Applicant in

Applicant's response to NRC staff questions dated April 17, 1980:

(a) Engineering classes.

(b) NEL Experiments.

(c) Maintenance.

(d) UCLA Users.

(e) Colleges and Universities.

(f) Demonstrations.

(g) Commercial.

42. Please also indicate the total actual run time for 1980.

43. Does the Applicant claim that the commercial use of the reactor, is a integral part of the educational function of the reactor program?

(a) If so, please explain why.

44. Does the commercial use of the reactor serve an educational function?

(a) If it does, please describe the educational function served.

45. Has the Reactor staff made any attempts to ascertain whether the fees charged for the commercial use of the reactor fully defray the cost of operating the reactor for commercial users?

(a) If the Reactor staff has made any such efforts please identify all documents which pertain to such efforts.

(b) Will Applicant produce these documents without a formal motion to produce?

46. For each year from 1975 to 1981 please identify all sources of NEL income other than SEAS or University budget appropriations and fees received for the reactor operating services.

47. Assuming that there is only one port in use, what does it cost the NEL to operate the reactor for one hour at full power?

48. Is the cost of operating the reactor any different when the reactor is run for the benefit of commercial users than when it is used for classroom instruction?

(a) If there is a difference, please describe in detail what factors account for this difference.

49. Would the dollar figure arrived at by dividing the total operating cost of the reactor for a given year by the number of hours run during that year give a fair estimate of the hourly cost of running the reactor?

(a) If not, why not?

(b) If not, how would the Applicant derive a cost figure for an hour of reactor operation?

50. Has the commercial use of the reactor increased over the last five years?

(a) If it has increased, to what does the Applicant attirbute this increase?

(b) What formal efforts has the NEL or its personnel undertaken to increase the commercial usage of the reactor?

51. Does the Applicant claim that the commercial use of the reactor provides an overall benefit for the NEL program and the University, other than as a source of income?

(a) If so, please describe the benefits?

52. What efforts has the NEL or its personnel made to encourage, increase or solicit use of the reactor by users from other colleges and Universities?

53. Does the Applicant have any knowledge of persons with the following last names, who were paid by Emil Kalil and Uranium West Labs for technical students assistance for the month of April 1980: Everett, Proffer, Schaffer, Smith, Ujithara, or Wheaton?

54. For each of the above listed persons which the Applicant has had any knowledge please provide their full names, current addresses, the academic program which they were enrolled in as of April 1980.

55. Please describe the activities for which the individuals listed in Interrogatory No. 53 were paid by Emil Kalil and Uranium West Labs in April 1980.

(a) For each activity described please indicate whether academic credit was received.

(b) For each activity described above for which academic credit was not received please indicate whether Applicant claims that the activities were part of its educational function.

(c) If the Applicant makes such a claim please explain why the activities are considered to be part of the educational function.

56. For reactor run #2596 (described more fully in Interrogatory No. 11), please indicate whether the three port hours for the run would be considered research as the term is used in Application, Page III/13. If so,

(a) Please define the term research as used in this context, and explain why the three port hours fit within that definition.

(b) Does the Applicant derive any benefits from the reseach other than the fee received for the use of the reactor?

(c) If the answer to 56 is affirmative, please specify the benefit received.

57. Some reactor runs refer to "Ashbaugh's diamonds" as being irradiated.

a. Do the diamonds belong to Mr. Ashbaugh?

b. If not, to whom do they belong?

c. To whom are the diamonds given after irradiation and cooling?

d. Does Mr. Ashbaugh pay any fee for the reactor use in cases of reactor runs involving "Ashbaugh's diamonds"?

e. Does Mr. Ashbaugh sell these diamonds after irradiation?

f. What documents exist which provide information regarding interrogatories 57 a through e above?

containing gold

58. Have gold rings or other jewelry/ever been irradiated in the reactor. If so, please provide details of such instances and the consequential radiation induced in the jewelry from such exposure.

59. Intervenor has heard it contended that there are currently merely 5 or 6 students, graduates and undergraduates combined, in the nuclear engineering program. Is this true? If not, how many is the correct number?

60. Annual (Specialized Activity) Report for 1967-68 contains at page 7 a table of student use, theses completed, reports issued, and faculty-staff publications 1960 through 1968. Please complete the chart for 1968-1981.

61. Precisely who authored the Applicant's answer to the NRC staff question of April 17, 1980, in which a chart of reactor usage was placed? From what documents and other sources was that chart put together?

INTERROGATORIES AS TO CONTENTION III

"Inadequate Managerial and Administrative Controls"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

   a. Please identify each and every such person.

   b. Please state the number of each interrogatory with respect to which that person was consulted.

   c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the

answers to these interrogatories.

3. Page V/6-2 of the Application sets forth a table of organization for the management and operation of the reactor facility (hereinafter "Facility"). For each level 2, 3, and 4 position indicated on the chart, please identify each and every person who has held each position since 1960 through the present and indicate the dates for which they held such positions.

4. For each individual identified in response to interrogatory no. 3, please indicate whether they are currently employed by the Regents of the University of California, and, if so, indicate their position, title, campus and department within the University.

5. For each individual identified in response to interrogatory no. 3, please indicate the last address and phone number of such person known to the Applicant.

6. Please indicate for each and every position listed on the chart for levels 2, 3, and 4 referenced in interrogatory no. 3, any periods of time in which no individual held the position or title.

7. For each period and position indicated in response to interrogatory no. 6, please identify any persons who were functionally or formally responsible for the duties of said position.

8. For the period 1960 through the present, was the organization for the management and operation of the Facility different from the organization indicated on the chart described in interrogatory no. 3?

9. If the answer to interrogatory no. 8 is in the affirmative, please describe in detail the changes in organizational structure from 1960 to the present.

10. If the answer to interrogatory no. 8 is in the affirmative, please identify all documents in Applicant's possession that describe previous organizational structures and changes from 1960 to the present, and as to each such document:

a. Please indicate if Applicant will provide a copy of each such document to Intervenor without a Motion to Produce.

11. For each year from 1960 to the present, please identify all individuals who were licensed to act as

licensed reactor operators at the Facility.

12. For each year from 1960 to the present, please identify each and every individual licensed to act as a Senior Reactor Operator at the Facility.

13. For each and every person identified in response to interrogatories no. 11 and 12, please indicate the initial date when licensed, initial expiration date, and each subsequent renewal starting and ending date for their operator or senior operator license.

14. Has any operator or senior operator operated the controls of the reactor after expiration of his or her license or during an interval between expiration and renewal of his or her license?

15. If the answer to interrogatory no. 14 is in the affirmative, please provide the dates of such operation of the reactor, the name or names of all operator(s) or senior operator(s), and the circumstances which led to said operation.

16. If the answer to interrogatory no. 14 is in the affirmative, please identify any and all records that document the occurence(s), and whether Applicant will

provide said records to Intervenor without a Motion to Produce.

17. Please identify each and every individual currently licensed to serve as operator or senior operator at the Facility, as well as the date when each license will expire.

18. Please identify each and every individual currently undergoing reactor operator training at the Facility.

19. For each year from 1975 through 1980, how many individuals have undergone reactor operator training at the Facility? If an individual received training in more than one year, list them only in the initial year of their training.

20. Section 6.1.3.1.B. of the proposed Technical Specifications states that "a licensed Senior Operator shall be readily available on call." Please state precisely what is meant by "readily available on call."

21. Please state for each year from 1960 to the present, unless this information was fully included in the answer to interrogatory no. 3, the name and address of each

and every person who served as a member of the Reactor Use Committee and the Radiation Use Committee, including their tenure on such committees.

22. Please indicate whether at any time from 1960 to the present any committee other than those listed in interrogatory no. 21 has existed which served functions and had responsibilities similar to those set forth in section 6.1.5. et seq. in the proposed Technical Specifications.

23. If the answer to interrogatory no. 22 is in the affirmative, please identify each such committee by name, describe its function and responsibility and state the name and address of each committee member.

24. Please identify for each year from 1960 to the present, each and every person who served as a member of the Campus Radiation Safety Committee, including their tenure on said committee.

25. Please state for all years 1960 to the present each and every time that the Reactor Use Committee, or its predecessors, have met, and further state:

a. For each meeting state if a quorum was present; and

b. For each meeting state if written records were

kept, and if so, state the name, address and phone number of the custodian of each written record, and whether Applicant will provide a copy of said records to Intervenor without a Motion to Produce.

26. Please state each and every action taken by the Reactor Use Committee and its predecessor committees which were considered to possibly "affect the operation and/or safety of the University community beyond the Nuclear Energy Laboratory facility" (as referred to in Section 6.1.5.2.C. of the proposed Technical Specifications).

27. For each and every action stated in response to interrogatory no. 26, state whether the action was brought to the attention of the Campus Radiation Safety Committee.

28. For each and every action stated in response to interrogatory no. 27, state the date of the Campus Radiation Safety Committee meeting at which the action was considered.

29. Please state whether the Campus Radiation Safety Committee has ever vetoed any actions recommended by the Reactor Use Committee or its predecessor committees.

30. If the answer to interrogatory no. 29 is in the affirmative, please state:

a. The date of each meeting at which an action was vetoed; and

b. The specific action vetoed.

31. Please state for each year from 1960 to the present for each and every time that the Campus Radiation Safety Committee has met:

a. If a quorum was present;

b. If a written record of the meeting was kept;

c. State the name, address and phone number of the custodian of each written record and whether the Applicant will provide such written records to Intervenor without a Motion to Produce.

32. Please state whether the Reactor Use Committee or its predecessor committees have ever appointed one or more individuals to perform the "Audit Function" defined in Section 6.1.5.4. of the proposed Technical Specifications.

33. If the answer to interrogatory no. 32 is in the affirmative, state:

a. The name of each and every person so appointed;

b. The dates for which each person held the "Audit Function" responsibility;

c. For each person appointed, their other

responsibilities at the Facility and at the University during their tenure of responsiblity for the "Audit Function."

34. Please indicate each date upon which an "Audit" was performed.

35. Please identify any and all written records produced in performing the "Audit Function" and identify the name, address and phone number of the custodian of said records and if Applicant will provide a copy of said records to Intervenor without a Motion to Produce.

36. Please indicate the date of each and every in-depth review of the Facility operations made pursuant to Section 6.1.5.4.A of the proposed Technical Specifications or its predecessor section in the current Technical Specifications.

37. For each and every review identified in response to interrogatory no. 36, please state whether there are written records related to each review, and if so, state:

a. Identify such written records with specificity;

b. The name, address and phone number of the custodian of each such written record;

c. If Applicant will provide a copy of each such written record to Intervenor without a Motion to Produce.

38. The forward to the proposed Technical Specifications indicates on page V/i that four changes were made in the Technical Specifications. Did the Reactor Use Committee or its predecessor committees review and approve these changes? If so, state the date of the meeting(s) at which this action was taken.

39. Sections 6.1.5.3.G and 6.4.1 refer to section 6.5.3 of the proposed Technical Specifications. Section 6.5.3 does not exist in the Intervenor's copy of the Application. Please state whether section 6.5.3 exists, and if so, please set forth the text thereof in full; and if not, please state which section should be the subject of the references in the above-mentioned sections.

40. For the Reactor Use Committee, the Radiation Use Committee, the Campus Radiation Safety Committee, and any predecessor committees, please identify any and all written by-laws, procedures or protocols for operation of these committees from 1960 to the present.

41. For each document identified in response to interrogatory no. 40, state:

a. If Applicant will provide access to Intervenor without a Motion to Produce.

42. Please identify all of the written procedures maintained by Applicant relating to the categories set forth below (as referenced in Section 6.2 of the proposed Technical Specifications):

a. Normal startup, operation and shutdown procedures for the reactor;

b. Procedures which delineate the operator action required in the event of specific malfunctions, abnormal occurrences, unscheduled shutdowns, and emergencies;

c. Radiological control procedures for all facility personnel;

d. Laboratory emergency procedures to guide the behavior and action of all personnel in the event of an emergency condition;

e. Procedures for the installation, determination of reactivity worth, and removal of experimental samples where reactor safety is concerned;

f. Procedures for experiments other than sample irradiation;

g. Procedures for handling irradiated and unirradiated fuel elements;

h. Procedures for operation of the Pneumatic Sample Transfer System.

43. For each document referenced in response to

interrogatory no. 42, please state:

a. The name, address and phone number of the custodian of such document;

b. If Applicant will make such documents available to Intervenor without a Motion to Produce;

c. Describe the normal location within the Facility of the documents;

d. The procedures which an NEL staffperson associated with the reactor, or a reactor operator or trainee, must go through to gain access to said documents.

44. Describe any and all efforts that the Applicant regularly takes to insure that reactor personnel are familiar with the written procedures identified in response to interrogatory no. 42.

45. Please specify the interval at which these regular efforts referenced in interrogatory no. 44 take place, and state the dates of such efforts from January 1, 1979 to the present.

46. Please describe any and all experiments which were reviewed by the Reactor Use Committee or its predecessor committee(s) from 1960 through the present as being "new experiments or classes of experiments that could affect reactivity or result in release of radioactive materials" as

Technical Specifications and whether the
referenced in 6.3.1 of the Reactor Use Committee or its predecessors reviewed said experiment or class of experiment.

47. Please identify all current Experiment Safety Analyses for the facility and if Applicant will provide access to said records to Intervenor without a Motion to Produce.

48. Please list all experiments conducted in 1980 and 1981 to date and state whether each experiment was approved prior to its operation by the reactor supervisor and the resident health physicist as specified by 6.3.2 of the proposed Technical Specifications.

49. Please list all experiments conducted between 1960 and 1979 which were run <u>without</u> prior approval of the reactor supervisor and the resident health physicist. If the procedures in effect at the time required prior approval from someone other than the reactor supervisor or the resident health physicist, do not list those experiments, unless the personnel who were required to give approval also did not give approval. In such a case, list the personnel who were at the time required to give such approval.

50. Please identify all reports filed with the NRC or

its predecessor agency by NEL containing the information identified in 6.5.1 of the proposed Technical Specifications.

51. Please specifically identify any and all reports made to the NRC or its predecessor agency described in 6.4.2.1 of the proposed Technical Specifications from 1960 through the present and identify the custodian of Applicant's copies of these reports.

52. Please specifically identify any and all reports made to the NRC or its predecessor agency described in 6.4.2.2 of the proposed Technical Specifications from 1960 through the present, and as to each report, state:

a. The name, address and phone number of the custodian of Applicant's copies of these reports;

b. If Applicant will make such reports available to Intervenor without a Motion to Produce.

53. Section 2.0 on page VI/2-1 of Application describes monthly operator meetings that have been initiated for the purposes of critiquing the operating log. Please state the date(s) of each such meeting and whether this program has been extended and/or expanded.

54. On Page 16 of the NEL Annual (Specialized Activity) Report for 1976 it is indicated that a group of students from Culver City High School "was able to come to UCLA to individually operate and observe the UCLA reactor."

a. What was the specific date or dates of the visit(s) by these individuals to the Facility?

b. Were visitor's log records kept for this visit or visits?

c. Did any of these visitors, with or without supervision, manipulate the controls of the reactor during this visit?

d. If Applicant does not know or have records of which persons manipulated the controls please so indicate.

e. If the answer to c is yes, precisely which controls were manipulated and precisely which reactor operations were manipulated. If power or reactivity was altered by the visitor, please specify the range of alteration.

f. Identify all individuals who were supervising this tour. Were all of the supervisors with the group for the entire visit? If not, for each supervisor please specify the period of time they were present with the tour group and the groups activities during such time.

g. How many individuals who were on this visit operated the reactor?

h. Please specify the names, addresses and phone

numbers of all persons who manipulated the controls.

i. If a teacher or tour leader from the visiting group accompanied the visit, please give name, address and phone number.

j. Please specify the age and educational background in nuclear engineering for each visitor who operated the reactor. If Applicant does not have precise information, please given an approximation of the age and educational background and indicate that it is an approximation.

k. Was any screening done of the visitors prior to permitting them to operate the reactor?

l. If the answer to k above was yes, please indicate the manner of screening and specify whether psychological health, physical health, physical coordination, manual dexterity, or educational background were factors in the screening.

m. If the answer to c. was affirmative, Was there specific Commission approval for this specific operation of the reactor by the visitors on this specific visit?

n. If the answer to m above was yes, please specify what form that approval took and what records exist of the approval.

o. Please specify all records that exist besides the visitor's log and the operator's log that document this specific visit to the NEL facility.

p. Did visitors get academic credit in an accredited nuclear engineering course for their manipulation of the controls or for their visit?

55. On Page 16 of the NEL Annual (Specialized Activity) Report for 1976 it is indicated that "approximately a dozen laboratory tours with a one-hour lecture on fission and fusion were given throughout the year to junior and senior high school students from the Southern California area." Please specify the name of each junior and senior high school which participated in these laboratory tours and for each specific tour, please answer the questions in interrogatory 54 above.

56. On Page 16 of the NEL Annual (Specialized Activity) Report for 1976 it is indicated that "as during the past five years, two evening seminars on nuclear energy were given in March and November to Los Angeles City high school teachers from the Hollywood Community Adult School." If either seminar involved a visit to NEL, please answer the questions in Interrogatory 54.

57. On page 17 of the NEL Annual (Specialized Activity) Report for 1976, it is indicated that

> On Saturday, September 11, 1976, a full-day seminar on nuclear energy was held at the NEL for high school and college professors. The subjects covered included basic nuclear reactor theory, fuel cycle, power plant operation and design, radiation measurement and effects, current controversial nuclear issues, and an actual hands-on operation of the UCLA Argonaut Reactor for all participants.

For the September 11, 1976 seminar, please answer all the questions in Interrogatory 54 except 54g.

58. On Page 17 of the NEL Annual (Specialized Activity) Report for 1976, it is indicated that "annually, the NEL provides one-hour lecture-tours of the laboratory to all but a few of the top management and the clerical staff of the UCLA Police Department. For each and everysuch lecture-tour, 1960 through the present, please answer the questions in Interrogatory 54.

59. On Page 17 of the NEL Annual (Specialized ACtivity) Report for 1976, it is indicated that "Miscellaneous lecture tours were also given to UCLA Alumni, the UCLA CHAPTER OF THE SOCIETY OF Women Engineers, minority recruitment, and so on. The NEL participated as usual in the Annual Engineering Week at UCLA by providing tour and a lecturer." Please identify every tour referred to in the above quotation and for each tour given, please answer the questions in Interrogatory 54.

60. On Page 17 of the NEL Annual (Specialized Activity) Report for 1976, it is indicated:

> The NEL provides space, telephones, and secretarial support for the Student Chapter of the ANS.

Meetings were held periodically in the laboratory lecture area, the elected officers were allowed to make chapter business phone calls, mail was sorted for the officers, and typing and mailing costs for the chapter were borne by the laboratory. When applicable, technical assistance was provided to the chapter by the staff and director of the NEL.

Have ANS members or visitors to ANS meetings from 1960 through the present ever operated the reactor other than those individuals who were licensed operators or senior operators or reactor operator trainees or operated the reactor as part of their work as students in a nuclear engineering course?

61. If the answer to Interrogatory 60 is yes, please specify each and every date during which such operation of the reactor occurred, and each and every individual who operated the reactor?

62. Page 16 of the Annual (Specialized Activity) Report for 1976 indicates:

One nuclear reactor operations experiment was given in support of the UCLA University Engineering Extension Division. The class, given once per year, is made up of degreed engineers from local industry, with

about half of them enrolled in the Electrical Power Certificate Program. The experiment consisted of a start-up, operation, and shut-down of a typical reactor. All students were able to operate and hence change the power of the reactor. A cadmium sample was also pneumatically removed from the core. The students took power/time data, and through the use of the Inhour equation were able to determine the "worth" of the sample.

a. For the extension class please answer the questions from Interrogatory 54.

b. In addition, please describe specifically the supervision measures taken, particularly regarding the pneumatic removal of the cadmium sample from the core.

c. Was a member of this class operating the reactor controls at the time?

d. Was this a nuclear engineering class?

63. Interrogatories ~~X~~ 54 through ~~IX~~ 62 are concerned primarily with the activities of non-NEL personnel visiting the reactor in 1976, please indicate for each of the years 1977 through 1981 whether the pattern of non-NEL personnel visits and use of the reactor was substantially the same described in response to Interrogatories 54 through 62 as in 1976.

a. If not, please indicate specifically what type of changes in the 1976 visitor patterns have occurred.

64. a. Has the question of operation of the reactor's controls by unlicensed operators ever been reviewed by any of NEL's super_visorial committees?

b. If so, please identify the committee(s) and the date(s) on which those reviews took place, what records exist of those meetings, and whether you will produce said records without a motion to produce.

65. . Did Charles E. Ashbaugh III receive prior permission from any of the NEL supervisorial committees, or the Reactor Director or Reactor Supervisor, before inviting Michael Douglas, Jane Fonda, James Bridges and Jack Lemmon to "operate our .1 MW_{th} nuclear reactor" in a letter dated April 9, 1979?

a. If the answer to 65 is affirmative, please detail from whom that permission was received and whether any written records exist of that permission and if so, whether you will produce those records absent a formal motion to produce.

b. If Mr. Ashbaugh did not have prior permission before extending said invitations, did he receive any reprimand thereafter?

c. If the answer to 65 b is affirmative, please describe the written records that exist regarding any such reprimand and whether you will produce those records without a motion to produce.

d. Does NEL have written procedures or policies regarding operation of the controls of the reactor by unlicensed operators?

e. If the answer to e above is affirmative, please describe in detail those written procedures or policies, what records exist regarding them. and whether you will produce those records absent a formal motion to produce.

66. Please identify each individual or group, not a licensed operator and not identified in the interrogatories above, who has operated the controls of the reactor 1975 through the present

a. give date

b. give name and nature of the visiting party

c. indicate what records exist of the incident

d. and whether Applicant will produce said records absent a formal motion to produce.

67. The Docket Bibliography for this reactor refers to a series of communications between the Commission and the Applicant in 1965 and 1966 regarding Applicant's request to be permitted to let unlicensed operators run the reactor controls and the Commission's unwillingness to permit an exemption from the regulations.

a. Please identify all documents and other records regarding this attempt by Applicant and the Commission's response. Will Applicant produce said documents absent a formal motion to produce?

b. Has Applicant subsequent to 1966 received written permission from the Commission regarding operation of the reactor controls by unlicensed operators? If som please identify all documents which record that permission and whether Applicant will produce said documents absent a formal motion to produce.

c. What documents are in Applicant's possession that define "operator," "controls", or "unlicensed operator"? What are those definitions, and will Applicant produce said documents absent a formal motion to produce?

68. Does Applicant contend that instances in which visitors such as the high school students from Culver City High School manipulated the reactor controls did not constitute unlicensed operation? If so, please

detail all facts in Applicant's possession which support such a contention.

69. Does Applicant contend that past instances in which visitors such as the high school students from Culver City High School manipulating the reactor controls did not constitute a violation of Commission regulations? If so, please detail all facts in Applicant's possession that support that contention.

70. Identify all periods during which the reactor Director was on sabbatical, 1960 to 1981.

a) What procedures are established for functioning of the facility during long-term absence of the Director?

71. What is the Director's teaching load, research load, consulting efforts, graduate student supervision, and supervision of the reactor operation in average hours per week?

a. What forms document that division of time?

b. What documents exist regarding the current Director's consulting time outside UCLA? How many days per year does he do such consulting?

c. Will Applicant produce the documents identified in a and b above absent a formal motion to produce?

INTERROGATORIES AS TO CONTENTION IV

"Violation of Regulations and Technical Specifications"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Please identify each violation of Commission regulations or Applicant's Technical Specifications that has occurred 1960 through the present.

a. Describe with specificity the violation

b. Identify the date of the violation

c. If recorded in an Inspection Report, provide the number and date of said Report

d. If a Notice of Violation was received, indicate the date of said Notice

e. If a written response to the violation outlining corrective measures taken or to be taken was sent to the Commission, identify the author of the response and the date of the response

f. If no Notice of Violation was received, but a violation of Commission regulations or Applicant's Technical Specifications took place, indicate why no Notice of Violation was received.

g. Describe all other documents in Applicant's possession which contain information regarding the violations described above.

h. Will Applicant produce documents identified in 3c, d, e, and g absent a formal motion to produce?

4. Please identify all Commission inspection reports, 1958 through the present, both for the construction license, operating license, and SNM license.

a. provide the date of issuance of the inspection report

b. its code number (i.e. 50-142/80-02)

c. the date of the inspection itself

d. the type of inspection conducted (e.g. radiological)

e. whether announced or unannounced

f. whether the Inspection Report has been declared proprietary

g. whether Applicant will produce all non-proprietary inspection reports not available currently to Intervenor in public document room (the above interrogatory asked in part to determine which, if any, inspection reports Intervenor does not currently have access to through PDR.) absent a formal motion to produce.

5. The earliest inspection report Intervenor has seen to date is dated June 1968. Were there inspections prior to that date? If so, how many?

6. The Docket bibliography for the UCLA reactor refers to notices of non-compliance and inspections as early as January 1962.

a. What records regarding inspections and notices of non-compliance not listed in answer to interrogatory 4 are in Applicant's possession?

b. Will Applicant provide said documents absent a formal motion to produce?

c. Were early inspections reported in forms other than Inspection Reports? If so, in what manner were they reported?

d. Were early notices of non-compliance or violation reported in forms other than Notices of Violation or Notices of Non-compliance? If so, in what manner were they reported?

7. Inspection Report 50-142/80-02 refers to an incident involving an uncontrolled reactivity change and malfunction of the reactor's safety amplifier. Please provide a detailed description of each of these instrument failures and malfunctions, including but not limited to the following details:

a. The date and time of the incident(s)

b. The duration of the failure or malfunction.

c. The cause of the failure or malfunction.

d. The manner in which the failure or malfunction was corrected.

e. Precisely what records were kept of the failure or malfunction and the efforts to correct it.

8. Will Applicant produce the records identified in 7e above absent a formal motion to produce?

9. Did the Applicant report each of the failures or malfunctions described in Interrogatory 7 to the NRC?

a. If not, why not?

b. Was this a violation or area of non-compliance?

c. If the answer to 9b is affirmative, what corrective measures have been taken to prevent its recurrence?

d. What written materials (including but not limited to correspondence with the NRC and revised operating procedures) exist in Applicant's possession which document the corrective measures detailed in answer to 9c?

e. Will Applicant produce said documents absent a formal motion to produce?

10. Have there ever been uncontrolled reactivity changes at the reactor similar to those described in response to Interrogatory 7?

a. If so, please identify the date of each such incident, the nature of the incident, and its cause.

b. For each incident identified in response to interrogatory 10, was the incident reported to the NRC in the fashion required of a reportable occurrence?

c. If not, why not?

11. Was the Applicant ever cited by the NRC for failure to do the heat balance calibration at the required interval?

a. If yes, when did that citation take place?

b. What documents exist regarding Applicant's efforts to prevent recurrence of that violation or non-compliance?

c. Will Applicant produce said documents absent a formal motion to produce?

12. Has Applicant ever failed to do the heat balance calibration at the required interval at any other time than the one identified in response to interrogatory 11 above?

a. If so, please identify each year in which the calibration was not done at the required interval.

b. Indicate why no citation or notice of non-compliance or violation was received.

c. Indicate all records that exist of each such instance and whether Applicant will produce said records absent a formal motion to produce.

13. Has Applicant ever failed to calibrate the area radiation monitors and stack effluent monitor at the required interval? If so,

a. Indicate each period during which those monitors were not calibrated at the required intervals

b. Which of the incidents noted in 13a above resulted in notices of violation or noncompliance from the Commission

c. Whether any of the incidents in 13a did not result in such a notice and if so, why not

c. What records document each instance, and whether Applicant will provide said records absent a formal motion to produce.

14. Are there any other instrument calibrations, besides those identified in response to interrogatories 11-13, that Applicant has failed to do at the required intervals in the period 1960 through the present? If so,

a. Detail each such instance, including the specific instrument calibration not done, the period of time when it was not done at the required interval

b. Whether a Commission Notice of Violation or Non-Compliance was received and a licensee response sent

c. If so, whether Applicant will produce the documents identified in 14 b above absent a formal motion to produce

d. If no notice of violation or non-compliance was received, why not?

15. Has Applicant ever received a Notice of violation or non-compliance for violating excess reactivity limits, either for the core as a whole or for combined experiments' worth or for a single irradiation port? If yes,

a. please indicate each such instance, the date of the notice, the date of the instance, and the specific details of the instance

b. Has Applicant ever violated the above-mentioned limits without receiving a Notice of violation or non-compliance?

c. If the answer to 15 b is affirmative, please detail each such instance, including date, nature of event, and what records exist which document the instance.

d. Will Applicant produce the records indicated in answer to 15c absent a formal motion to produce?

e. If no notice of violation or non-compliance was received, why not?

16. Has Applicant ever been cited by the Commission for the height of the reactor's exhaust stack not being in conformance with the Technical Specifications? If so, please provide details.

a. Was the nonconformance existent prior to the notice of noncompliance?

b. If so, for how long?

17. Has Applicant ever been cited by the Commission for removing the acceleration nozzle from the exhaust stack? If so, please provide details.

a. During what periods prior to the notice of non-compliance was the nozzle also not on the top of the exhaust stack?

18. Has Applicant ever been cited by the Commission for conducting non-standard experiments (such as bypassing scram circuitry) without prior approval from the appropriate sources? If so, please detail each instance.

19. Has Applicant ever conducted non-standard experiments without prior approval from the appropriate sources other than the instance(s) identified in response to interrogatory 18? If so,

a. please identify each instance by date, nature of non-standard experiment, whose approval was not received, and cause of instance.

b. If no notice of violation or non-compliance was received, why not?

20. Has Applicant ever failed to comply with the regulations in force at the time for preparation for shipment of special nuclear materials? If so,

a. Please identify each instance where such non-compliance occurred, what specific regulation provisions were not complied with, and why those provisions were not complied with.

b. Applicant stated at a prehearing conference on February 5, 1981, that no Notice of Non-Compliance was going to come from NRC Inspection and Enforcement headquarters. Precisely how did Applicant know that?

c. Does Applicant contend that no violation occurred during the June, 1980, shipment, or rather that the noncompliance or violation was not its fault?

d. Inspection Report 79-01 recommends that arrangements be made for an NRC inspector to be present at the time of shipment. Were such arrangements made and was such an inspector present at the shipment?

21. Does Applicant have any facts, data, or other information by which to compare or contrast its record of compliance with that of other similar facilities. If so, please detail that information.

a. In addition, what documents does Applicant have in its possession that provide such information. Will Applicant provide such records absent a formal motion to produce?

22. NRC Memo "Enforcement Conference and Subsequent Actions" dealing with an enforcement conference of April 11, 1975, states: "the revised calibration figure on the gaseous effluent monitor had revealed that annual average discharge concentrations were above limits permitted by the Technical Specifications (essentially 10 CFR 20 limits)." For how long a period prior to that enforcement conference were emissions in excess of those levels?

23. Have any employees of Applicant ever received reportable radiation doses that were not reported to the Commission? If so, please describe each such incident, including but not limited to:

a. the time and date of each incident.

b. the names and addresses of e ach employee involved.

c. why the incident was not reported.

d. the doses received by each such person.

e. identify all records for each such incident

f. will Applicant provide such records without a formal motion to produce?

24. A memo of October 15, 1974, from G.S. Spencer to H.D. Thornburg, both of the Commission, states: "The items of noncompliance appear to be oversights which indicate a need for more disciplined management. This conclusion is reinforced by previous experience with this licensee. Consequently, we intend to broaden the inspection effort at this facility until improved performance is evident."

a. Precisely to what is the memo referring regarding "previous experience with this licensee"?

25. a. Does Applicant contend that it does not have a history of non-compliance? b. Does it contend that it has had such a history, but in recent years the situation has improved? c. Or does Applicant contend it has had such a history and that the situation remains pretty much the same as in the past?

INTERROGATORIES AS TO CONTENTION V

"Excessive Excess Reactivity"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

I. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatorries which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please indentify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicatn in preparation of the answers to these interrogatories.

3. Please specify all documents in Applicant's possession (including but not limited to safety analyses, Environmental Impact Assessments, Environmental Impact Statements, Environmental Impact Appraisals, negative declarations, supporting studies, correspondence between the Applicant and the Commission and such other documents) that exist regarding the following three amendments to Applicant's license:

a. Amendment increasing power from 10 kw to 100 kw thermal

b. Amendment increasing licensed limit on excess reactivity from .6 $\%\Delta k/k$

c. Amendment permitting installation of pneumatic tube system and indicate whether Applicant will produce documents absent a formal motion to produce?

4. What is the largest positive worth sample ever inserted in the NEL reactor?

a. Please give the worth, the substance of which the sample was composed, and the date of such irradiation.

b. If this was the largest sample of which the Applicant is currently aware, but larger samples may have been inserted of which Applicant is not currently aware, please so indicate.

5. Please answer question 4. for the largest negative worth sample.

6. What is the largest <u>combined</u> worth of experiments ever inserted in the reactor, positive or negative?

a. Please answer question 4 a and b for question 6.

7. Please give the interior dimensions and/or volume of the sample containers utilized in the pneumatic tube system, i.e., what is the maximum dimensions and volume of sample material that could be inserted into the reactor via Applicant's pneumatic tube system?

8. Are samples inserted through the pneumatic tube system ever in liquid solution?

a. If yes, what liquid dilutents are employed?

b. What is the dilution range employed (1 cc solid sample diluted in x cc's of dilutent; giving the maximum and minimum dilution levels employed in such samples) ?

c. Total quantity of dilutent used.

d. What effect on reactivity/moderation, reflection/absorption is there from the use of water and other liquids as a dilutent?

e. Please answer the same questions for the various irradiation ports.

9. Precisely what is meant by the term "rabbit" used in connection with the pneumatic tube?

a. What is a rabbit?

b. What is it made of?

c. What are its dimensions, internal volume, and wall thickness?

d. How is it opened or closed for sample insertion or withdrawal?

e. If there are structures within structures for ample containers describe with specifics all such structures.

f. Please provide a drawing of a sample rabbit.

g. Are there different size rabbits- if so, specify the varying sizes.

h. What is a"cracked rabbit cap"?

i. What kinds of rabbit failure constitute a "Failed Rabbit" as defined in "Failed Rabbit Proceedure" contained in NRC Inspection Report 80-02 on page 3?

j. Will you provide that proce dure absent a motion to produce?

k. Will Applicant produce for physical inspection one of these sample containers, one that has never been used, absent a formal motion to produce?

10. For a 15¢ sample of uranium ore to be irradiated for Emil Kalil's Uranium West, would the ore be placed in a solution and the solution inserted into the reactor? If yes, what would the dilutent be composed of, how much would be used, how much ore would be placed into solution, and what would be the concentration?

11. What quantity of uranium ore or what concentration if the ore is first diluted before insertion, would be required to produce a sample worth:

a. 15¢

b. 30¢

c. 48¢

d. $1.50

e. $3.00

f. $3.54

12. How was the answer to 11 determined?

a. Please provide all calculations, tables , charts etc. used in the preparation of the answer to question 11.

b. What written materials or documents support the answers to question 11?

c. Will Applicant produce absent a formal motion to produce?

13. Does Applicant contend that it is physically impossible for a sample worth:

a. $\pm$ 2.3%Δk/k to physically fit inside a pneuamtic tube "rabbit"?

b. $\pm$ 2.1%Δk/k to physically fit inside a pneumatic tube "rabbit"?

14. If the answer to 13 is yes, please indicate with specificity the reasons which form the basis of the Applicant's contention, and any and all documents (including studies, articles, etc.) which are in the Applicant's possession which back up or contradict Applicant's contention, and whether said documents will be provided absent a formal motion to produce.

15. If the answer to 13 above is yes, please indicate the largest worth sample which Applicant contends is possible to fit inside a pneumatic tube container and the calculations and documents which support or contradict Applicant's contention, and whether said documents will be provided absent a formal motion to produce.

16. Does Applicant contend that it is physically impossible for a sample worth $\pm$ 2.3%Δk/k to physically fit inside an irradiation port?

17. If the answer to 16 is yes, please answer questions 14 and 15 with reference to irradiation port instead of pneumatic tube.

18. If the answers to 13 and 16 are no, please provide all calculations and documents which form the basis of that answer and indicate whether the documents will be provided absent a formal motion to produce.

19. Is it Applicant's position that, separate from the issue of whether such a sample could fit into a pneumatic tube sample container or an irradiation port container, it is physically impossible for a sample worth ± 2.3% Δ k/k to be inserted into the reactor?

a. If so, precisely what mechanisms would prevent such insertion?

b. Have those mechanisms ever failed?

c. Can they be overridden?

d. Do these mechanisms require some human involvement to be set, responded to, monitored etc.?

e. How often are those mechanisms maintained, calibrated, tested or serviced?

f. What documents exist that record information related to questions 19 a through e and will Applicant provide them without a formal motion to produce?

20. Please answer interrogatory 19 a-f for a sample worth ±2.1%Δk/k.

21. Please answer interrogatory 19 a-f for sample worth ± 2.3%Δk/k prevented from being being withdrawn from the reactor without the control blades being inserted for,

a. A sample inserted through the pneumatic tube

b. A sample in an irradiation port

22. Please answer interrogatory 21 a and b for a sample worth ± 2.1%ΔK/K.

23. Please indicate what is the smallest (±) worth sample that can be inserted in the reactor without intervention of physical prevention mechanisms and what records exist that document that answer and whether Applicant will provide said records without a formal motion to produce.

24. Have pneumatic tube "rabbits" ever failed and/or cracked and or leaked? If yes,

a. Please provide the date and details of each incident, including the cause(s) if determined.

b. Specify all records that exist of said incident(s) and whether Applicant will provide documents without a formal motion to produce.

25. Is the reactivity "worth" of a sample actually measured prior to insertion in the reactor as opposed to being merely calcualted? If yes;

a. What means are used to make the measurement(s)

b. How often is the measuring system calibrated

c. What is the probability of error (error bars) on the measurement

d. Have calibration errors or measurement errors ever occurred: if so, provide specific details and dates of each incident

e. What written proce dures exist regarding measurements?

f. What written records exist regarding questions a through e and will Applicant provide them without a formal motion to produce?

26. If the answer to 25 is no, is the sample's worth calculated prior to insertion into the reactor? If calculated,

a. Is each and every sample independently calcu lated?

b. If no to a above, on what basis is it determined that a particular sample worth should or should not be calculated?

c. If no to a above, who makes that determination?

d. Specify all experiment safety analyses related to determination of sample's worth and all proceedures so related and whether you will provide without a formal motion to produce?

e. How is the calculation performed, using what formulas and methods?

f. What is the largest error found in comparing calculated worths with actual worths, when did that error occur, and what documents are there regarding it; will Applicant provide said documents without formal motion to produce?

27. On what forms is a sample's measured or calcua_ted worth written prior to insertion into the reactor? Will Applicant produce these forms absent a formal motion to produce?

28. Has the worth of a sample ever failed to be recorded or calculated on the forms indentified in answer to interrogatory 27 above?

a. If yes, please indicate each time this occurred, its cause whether the NRC inspection and enfor cement division ever called this matter to Applicant's attention, and what documents exist regarding the failure to so record.

b. Will Applicant provide said documents without a formal motion to produce?

29. Has a sample ever been inserted in the reactor prior to being measured or calculated?

a. If so, please indicated each and every time this occurred, the reason it occurred, whether the NRC inspection and enforcement division ever called this matter to Applicant's attention, and what documents exist regarding this failure?

c. Will Applicant provide said documents without a formal motion to produce?

30. Besides those devices and systems identified in interrogatories 19-23, what interlocks and/or inhibits and /or scram systems exist that would prevent the insertion of a sample worth $\pm$ 2.3% $\Delta k/k$? Be specific about the interlocks and/or inhibits, and/or scram systems, how they work, their accuracy, whether they have ever failed, whether and how they can be overriden or disconnected and if and when they have ever been overriden or disconnected.

a. What is the largest sample that can be inserted without these systems coming into play?

b. If one of these systems prevent insertion and are overriden, is there any other system that prevents reactor operation or control blade withdrawal? Can this system be overriden or disconnected? Has it or the primary system ever failed? If so, provide details. What documents exist upon which these answers are based? Will they be provided without a formal motion to produce?

31. Please answer interrogatory 30 for a sample worth ± 2.1% Δ K/K.

32. Please answer interrogatory 30 for a mechanism to prevent a sample worth ± 2.3% Δ K/K from being withdrawn from the reactor without the control rods first being inserted?

33. Please answer interrogatory 32 for a sample worth 2.1% Δ k/k.

34. For interrogatories 30-33, please identify the threshholds (in terms of sample worth) for each device so identified.

35. Identify all occasions on which the devices or systems identified in interrogatories 19-23 and 30-24 have been tested.

a. The date of such test.

b. The nature of such test.

c. What records exist of said tests?

d. Whether Applicant will produce said records absent a formal motion to produce?

36. Regarding page III/A-1, TABLE B-1 of Application: how is temperature coefficient of reactivity estimated?

a. Is a temperature coefficient of reactivity available? If not, why? If yes, what is it, and why wasn't it used here?

37. How is the void coefficient of reactivity calculated? Is a measurement available? If not, why? If yes, what is it, and why wasn't it used here?

38. Regarding page III/A-2, bottom of the Application;

a. Do these calculations implicitly assume a uniform temperature distribution across the coolant flow?

b. Since exit temperature is taken as 100 C, won't any inhomogeneity in temperature distribution result in boiling?

c. Are any measurements of temperature distribution available? If yes, what were the results? If not, why not?

d. Why is the absolute magnitude of the water-temperature coefficient of reactivity no smaller than the water-density coefficient of reactivity referred to a temperature scale?

39. Regarding page III/A-3, the top line of the Application;

a. What power would cause fuel-plate burnout?

b. Does this determination assume a time duration?

c. What is the time period used here, and why?

d. Does any fuel-plate damage occur before the aluminum melts? If so, how much damage occurs?

e. Is there any fuel-plate distortion at temperatures less than melt-down? What would the effect be of such distortion?

f. If coolant boils, how uniform would fuel-plate temperature remain? May localized heating and consequent damage occur? Describe any such effect.

40. Has the void coefficient changed, or the figure for it been altered, since the original calculations included in Attachment A of section III of the Application were done?

a. If there has been a change, what caused the change?

b. Would not that change alter the calculations, reducing the level of excess reactivity insertion necessary to cause melting of the fuel cladding?

c. If the answer to b above is affirmative, what would be the new "safe limit" of excess reactivity based on the current void coefficient figure? Please provide all calculations?

d. If the answer to b above is negative, why is that so? Please provide all facts in Applicant's possession that support or contradict that answer, and indicate all documents related to the answer and whether Applicant will prod_uce said documents absent a formal motion to produce.

41. The Hazards Analysis of 1960, from which Attachment A was reproduced, includes graphs of excess reactivity versus period.

a. From where were those graphs obtained?

b. Do they apply to any other Argonaut-type reactor as well?

c. Do they actually come from another Argonaut-type reactor?

d. Is there any reason why they would not apply to the UCLA reactor? If so, what are those reasons?

e. Were those graphs obtained experimentally or through calculations?

f. What are the error bars obtained with those graphs, particularly the one that correlates 9 millisecond period with 2.3% excess reactivity?

g. Does the Beta figure written on those graphs refer to the UCLA reactor?

h. Does the Beta refer to Beta or to Beta effective?

i. explain the discrepancy with other figures for Beta or Beta effective appearing in other UCLA documents.

j. Is that Beta figure correct for UCLA (either as Beta or Beta effective)?

k. If it is not correct, how does that alter those graphs and the excess reactivity calculations?

42. The Application contains several other references to Beta.

a. what is the correct Beta for the UCLA reactor?

b. what is the correct Beta effective for the UCLA reactor?

c. how does Applicant know which Beta and Beta effective are correct?

d. where did the discrepancies arise?

e. which Beta or Beta effective is the correct "means of exchange" for converting percent of excess reactivity into dollars and cents?

f. what records does Applicant have that document the answers to 41 and 42? Will Applicant provide said documents absent a formal motion to produce?

43. What degree of confidence (in terms of error bars) does Applicant believe can be given to the Borax data?

a. What facts are in Applicant's possession on which it bases the above answer?

b. Which Borax data are questionable because of loss of instrumentation due to the severity of the destruction?

44. Professor Catton commented at the conference between parties following the September 1980 pre-hearing conference that the Borax reactor was not blown up intentionally, at least it was not intentional that it blew up when it did.

a. Please provide all information available to Professor Catton or others associated with Applicant that can support that statement.

45. If the maximum possible Wigner energy stored by the year 2000 in the reactor graphite, given past operating history and maximum permitted operation through a new 20-year license, were to be released in the midst of an excess reactivity initiated power excursion, how much heat to the fuel elements and cladding would that contribute and by how much what that then reduce the amount of excess reactivity insertion necessary to bring the hottest part of the fuel to the melting point of the cladding?

a. Please provide all calculations.

b. Please indicate all facts upon which those calculations are based.

c. Please indicate all documents upon which those calculations and facts are based; will Applicant produce said documents absent a formal motion to produce?

46. Was the positive temperature coefficient of graphite ignored in the calculations included in Attachment A of part III of the Application?

a) if so, why?

b) if so, what would be the effect on the calculations of including that matter into the calculations?

c) Please provide all calculations related to be above and indicate all documents that relate to answers to 46, a, b, and c; will Applicant produce said documents absent a formal motion to produce?

47. Would uranium ore inserted into the reactor for activation analysis/ delayed neutron counting of x% uranium content be worth 1/10th the reactivity worth of the same volume of uranium ore that contained 10 times the concentration of uranium relative to the rest of the ore sample?

a) If not, what is the relationship between uranium content and reactivity worth?

b) precisely what is it in the ore that absorbs neutrons?

d) is it possible for an ore sample thus to have significantly greater concentration of those absorbers to increase reactivity worth by a factor of 10 over normal?

e. is it possible for an ore sample to have a reactivity worth of 2.3% just on the basis of significantly higher concentration of absorbing material?

48. Does Applicant admit that the Borax reactor was only moderated by water and that the UCLA reactor is moderated and reflected by graphite as well as moderated by water? If so,

a. How can the Borax results be reliably extrapolated to the UCLA situation?

b. If those results are extrapolated, through the calculations employed in Attachment A of Section III of the Application, how large should be the error bars in making the extrapolation?

c. On what basis does Applicant answer interrogatories 48 and a and b; please provide all calculations and indicate all studies, experiments, and other documents consulted and whether Applicant will produce all such documents absent a formal motion to produce?

49. What data more current than the Borax data has Applicant reviewed in determining the safety of its facility regarding excess reactivity?

a. Please indicate all documents that relate to the answer to 49 and whether Applicant will produce said documents absent a formal motion to produce?

50. Attachment A, page 3, provides a formula for determining the minimum number of MW-seconds necessary to bring the temperature of the hottest part of the fuel to 1000°F over the boiling temperature of water, which the analysis indicates is the melting point of the cladding. Later parts of the analysis show how to convert MW-seconds into % delta k/k of excess reactivity and period, concluding through simple math that a 9 millisecond period, corresponding to 2.3% excess reactivity, is the level that will bring the fuel to that temperature.

a. How does analysis get from the point of showing that that level of excess reactivity and that short a period brings you to the melting point to the conclusion that that excess reactivity and period can be tolerated without melting?

b. is this merely a way of saying 2.3% is the safe limit, below which is OK and above which is possibly dangerous?

d. Was not the analysis which led to the estimation of 2.3% merely a way of showing that .6%, the limit at the time of the analysis, was safe because there was a big safety margin (up to somewhere around 2.3%) until one reached the danger zone?

51. What level of excess reactivity and what corresponding period does Applicant currently contend represents a clearly safe?

a. What is the basis of that answer.

b. What documents support or contradict that answer? Will Applicant produce said documents absent a formal motion to produce?

INTERROGATORIES AS TO CONTENTION VI

"Excessive Emissions, Inadequate Monitoring"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

(a) Please identify each and every such person.

(b) Please state the number of each interrogatory with respect to which that person was consulted.

(c) Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Please identify any and all data that is in the possession of Applicant, relating to radioactive emissions from

the reactor, from 1960 through the present. The answer to this interrogatory should include but not be limited to:

(a) Identification of any and all tests or procedures relating to radioactive emissions from the reactor from which data was derived.

(b) The dates when such tests and procedures were conducted.

(c) The frequency of any ongoing tests or procedures.

(d) Identification of raw data as well as summations, conclusions or final reports based on such raw data.

(e) For each source of data please indicate whether you will provide such data without a formal motion to produce.

4. The following questions relate to the two year thermoluminescent dosimeter (TLD) study conducted by the NEL and concluded in June 1978.

(a) Did the Applicant, employ or otherwise utilize an outside company in conducting or administering the thermoluminescent dosimeter (TLD) program?

(b) If so, please identify the company or companies utilized.

(c) If so, please explain the services performed by the company for the Applicant relative to the TLD program.

(d) Who was responsible for choosing the company used?

(e) Why was the particular company used chosen?

(f) Was the choice made by a formal bid process?

(g) If not, why not?

5. Please specify the location of all TLD's used in the program.

(a) Were any of these TLD's removed or lost during the program? If so which ones?

(b) Were any of these TLD's replaced because of malfunctions or other performance problems?

6. Please specify the location of any and all TLD's which were considered control TLD's.

(a) Were any measurements of background radiation at the site of the control TLD's taken during the program? Other than readings of the control TLD's themselves?

(b) If not, why not?

(c) If so, what were the results of each control TLD?

(d) If so, how often were the measurements taken?

(e) Please explain how and why the sites for the control TLD's were chosen.

7. What is the operational life of the type of TLD's used in the TLD program?

8. Were any specific tests ever conducted to determine whether or not the TLD's were picking up radiation from the concrete or granite?

(a) If so, please describe such tests and identify any and all data generated by such tests.

(b) If not, why not?

(c) If not, on what information does the Applicant base its conclusions expressed on Page V/3-10 of the Application that the TLD readings were being affected by such radiation?

(d) Why wasn't the program repeated with TLD placements which would not be affected by the concrete and granite or with TLD's shielded from the concrete and granite radiation?

9. Were tests ever conducted to measure the background radiation at the locations of the non-control dosimeters?

(a) If so, what was the operating status of the reactor during such test?

10. Other than the reactor itself, or the buildings themselves, identify any and all sources of radiation on the UCLA campus which might have effected the TLD readings?

(a) Were any tests conducted to determine what the effect of these other radiation sources were on the TLD readings?

11. Does the Applicant have any reason to doubt the validity or accuracy of the results obtained from its TLD program?

(a) If the Applicant has doubts please explain the nature of these doubts.

12. Does the Applicant believe that its efforts to monitor the radioactive emissions of the reactor have been sufficient to determine with confidence the amount of radiation emitted by the reactor?

(a) Please identify each test or study which has provided data sufficient to determine with confidence the amount of radiation emitted by the reactor?

(b) Please answer the questions posed in Interrogatories 9 and 9a for the determination of radiation reaching the roof and interior of the Math-Sciences Building.

13. Is the statement "UCLA expresses no confidence in either the TLD data or its extrapolation" made by Walter Wegst in his December 9, 1980 letter to Dr. John Ahearne of the NRC true?

14. Does the Applicant intend to rely in any way on the September 24, 1980 Director's Decision (DD 80-30) in its defense against Contention VI?

15. Please indicate each year in which film badges were used as a means of measuring radiation inside and outside of the reactor facility.

16. Please describe what type or types of film badges were used in each year from 1970 to 1981.

(a) If in any year there were more than one type of film badge used please indicate the type and location of each type film badge.

17. For each type of film badge indentified in response to Interrogatory No. 16, please indicate the sensitivity of the badge type.

18. When Applicant specifies in Applicant's response of 8/22/80 to NRC staff question No. 7 of 7/31/80 , that certain film badges have a threshold of 10 mr/month or 10 mr/quarter, does that indicated 10 mr total radiation or 10 mr over background?

(a) When a reading is expressed as 0 mr, does that indicate no radiation, 0 mr over background, or 0 mr over threshold?

19. Indicate each year and/or quarter which the film badges have been located in the same positions as are indicated on Pages II/2-1a to II/2-4 of the Application.

(a) Please indicate all other locations where film badges have been placed and dates when in place.

20. Are the figures whosn in Table II/2-1 of the Application derived solely from the film badge readings?

(a) If not, please indicate what other sources of data have been used and how the figures have been derived.

21. Please explain why the readings cited on Page II/2-1a of the Application for film badges No. 265 and No. 203 located on the reactor stack are many times higher than the reading cited on Page 23 of Annual Report 1978 on the TLD that was located in the same position.

(a) Please explain the discrepency between the film badge readings for badges No. 265 and No. 203 in Interrogatory No. 21 and the statement in an October 11, 1979 press release from the SEAS that a persor sitting beside the stack all year long would receive an annual radiation dosage of less than 50 Millirems.

(b) Which reading does the Applicant deem to be more reliable and accurate and why?

22. Has film that was beyond its expiration date ever been provided to NEL for use in film badges?

(a) If so, please indicate each occasion on which this has occured?

(b) Has such film ever been used by the NEL?

(c) Please identify the supplier of any expired film that NEL has received.

(d) Please indicate how the fact of the film's expiration was discovered by NEL?

(e) What actions were taken by NEL in response to the provision of expired film by their suppliers?

23. Please identify any and all documents which would specify the locations of all film badges used by NEL for radiation monitoring and any documents which contain any data, raw and compiled, regarding the readings of the film badges, over the current license period.

24. Does the NEL do any of its own film badge analysis?

(a) If so, please specify how much, and by whom it is done.

(b) If not, please identify who does the film badge analysis.

25. Was a TLD placed in Culver City as part of the TLD program?

(a) If so, what was the precise address of the location?

(b) Was the TLD located at the home of a University employee?

(c) If so, please identify the employee.

26. Was a TLD placed in the reactor supervisors office?

(a) Was this TLD considered a control TLD?

(b) Why was the reactor supervisor's office chosen as the site for a control TLD?

27. The 1979 Annual Report for the reactor states on Page 9 that Argon 41 releases for that year totalled 82.9 Ci. The Application, states, on Page II/2-5 that the annual release of radioactive Argon 41 for 1979 was 65.5 Ci. Please indicate why there is a discrepency between these two documents, including but not limited to:

(a) Which figure Applicant considers more accurate.

(b) How the two figures were derived.

28. Has the NEL ever purchased, built or utilized any device to monitor Argon-41 emissions that is capable of directly measuring Argon-41?

(a) If so, please describe the device and describe the manner, time and places in which it has been used by the NEL.

(b) If not, why has such a device never been obtained?

(c) What would it cost to buy or build such a device?

(d) Is it possible to measure with confidence the Argon-41 emissions of the reactor in the areas surrounding the reactor stack without the use of such a device? If so, please describe how this can be done.

29. Is the number of curies of radiation emitted by the reactor each year directly proportional to the number of reactor kwh/annum?

(a) If not, please describe the relationship between kwh/annum of operation and curies of radiation emitted.

(b) Please indicate from what information or data the answers to Interrogatory No. 30 and 30a are based.

30. In 1975 in a November 5 letter written by William Kastenberg to Karl Goller it was stated that hold-up decay tanks could be installed for around $1,000.00 or more. Why were not the hold-up decay tanks installed?

(a) Who made the decision not to install the decay tanks?

(b) Please identify any and all documents which contain information about the need for decay tanks, the cost of installing them or the decision not to install them.

31. Please identify all devices for measuring neutrons located outside of the reactor room.

(a) For each such device specify the type of device, its threshold, its sensitivity, its accuracy and the frequency with which it takes measurements.

(b) Please identify all raw data derived from the neurton measuring devices.

(c) Will you provide the raw data without a formal motion to produce?

32. What neutron measuring devices are placed in the area directly above the reactor room, sometimes known as the void area or equipment room?

33. What neutron measuring devices are placed in the area which contains the demineralizing tank if that area is different than the area described in Interrogatory No. 32?

34. For both Interrogatories 32 and 33 please identify any and all raw data derived from the neutron measuring devices described in response to those interrogatories.

(a) Will you produce such raw data without a formal motion to produce?

35. Is the occupancy analysis of the roof areas, adjacent to the reactor stack contained in the Safety Analysis that attended the Application for Amendment 10 to the Facility License r-71 the most current occupancy analysis undertaken by Applicant?

(a) If no, please identify any more current occupancy analyses conducted.

36. For the most current occupancy analysis of the roof and interior of the Math-Sciences Building:

(a) Precisely how was the roof occupancy determined?

(b) What efforts have been made to ascertain the continuing validity of the roof occupancy determination?

(c) How was transit time considered in determining occupancy?

(d) How was planetarium occupancy considered in determining occupancy?

(e) Were any physical obersvations made, please identify any and all records of such obersations.

(g) If physical observations were made, please describe the time of day, duration and frequency of such observations.

(h) What records exist upon which the occupancy of the Math-Science Building was determined?

37. Was the occupancy of the portions of the Math-Sciences Building which would effected by the intake of radiation into the air-conditioning system determined?

(a) If not, why not?

(b) If so, please describe how the occupancy figures were determined.

(c) If so, please describe how it was determined which portions of the Math-Sciences building would be effected?

(d) Was the occupancy factor for the affected portions of the Math-Sciences Building considered as the occupancy factor of the roof at the point of the air-conditioning intake in determining the roof occupancy?

(e) If not, why not?

38. Were weekly counts of persons observed on the roof ever recorded in the operating log?

(a) If so, please indicate on which dates and log pages counts are recorded.

39. Were any devices ever placed inside the rooms of the Math-Sciences Building which have windows which open facing the reactor exhaust stack area?

(a) If so, please indicate the location and period of each such device and identify any records or data which were derived from such devices.

(b) Will you provide such data and records without a formal motion to produce?

40. What percentage of the gamma radiation from the emitted Argon-41, does Applicant believe, penetrates the walls, ceilings, floors, and partitions in the Math-Sciences Building?

(a) On what information or data is the response to Interrogatory No. 40 based?

(b) If some percentage of the Argon-41 gamma radiation may penetrate the walls, ceilings, floors and partitions of the Math-Sciences Building, was this factor considered in determining the possible radiation exposures to the Math-Sciences Building occupants?

(c) If the penetration of gamma radiation was considered please describe how it was considered in determining radiation exposures?

(d) If the penetration of gamma radiation was not considered please indicate why it was not considered, and why it need not be considered.

41. On October 23, 1979, Applicant apprised the NRC of an increase in roof occupany due to a balloon release program atop the Math-Sicence Building. In determining the resulting occupancy of the rooftop, did the Applicant determine only the occupancy created by the program, or did the Applicant add the occupancy created by the balloon program to the existing occupancy factor?

(a) If the occupany was not cumulative please indicate what the total occupany factor would be when cumulated.

(b) If the occupany was not cumulative please explain why it was not cumulated.

42. On Page V/7-1 of the Application, Applicant indicates that the ALARA program of the facility includes the consolidation of multiple users into common runs whenever possible in order to minimize operating hours, please describe any and all other efforts currently being taken by the Applicant to reduce emissions to lowest level reasonably achievable.

(a) For any efforts so described please indicate, the date, duration and frequency of such efforts.

43. Has Applicant installed hold-up decay tanks at the reactor facility?

44. How much would the installation of hold-up decay tanks be likely to cost?

45. Has the Applicant considered raising the level of the exhaust stack in order to reduce possible exposures in the adjacent areas?

(a) If so, please indicate why this was not undertaken.

(b) Was it not undertaken primarily or partially because of the expense?

(c) Please estimate what it would cost to raise the stack twenty (20) feet.

46. In the period since 1974 have any modifications or improvements to the facility which would reduce the radioactive emissions reaching the adjacent areas, and which would cost under Two Thousand Dollars ($2,000.00) been considered?

(a) If so, please describe any such modifications and improvements.

47. In Applicant's August 22, 1980 response to NRC questions the answer to question 8, Page 2, the Applicant states that the center of the exhaust plume into prevailing winds is assumed to be closer to the MSA air intake than assumed in the Rubin Thesis.

(a) How close (in feet or meters) would be the shortest distance from the MS air intake and the center of the exhaust plume under these assumed conditions?

48. Which radioactive element comprises the largest source strength (curies/Hr.), and which the largest internal dose rate (REM/DAY), next after Argon-41, at the exhaust stack?

(a) At nearby rooftop work or access areas?

49. What are the source strengths and dose rates at these locations?

50. What effects does the existence of this nuclide have on Argon-41 monitors?

51. Has Applicant ever stored a leaking Cobalt-60 source within NEL?

a. If so, precisely where in NEL was it stored?

b. Was it ever stored in the spent fuel storage area or near that area?

c. If so, give precise details on how it was stored?

d. Could it ever have come in contact with spent fuel or liquid around the spent fuel

e. Please indicate the cause of the leak, and the strength of the source?

f. For what was the source used?

g. Indicate all locations within NEL during which the Cobalt-60 source was ever placed.

h. when and how and to where was it shipped?

i. what records document the answers to 51 a through h.

j. will Applicant produce said records absent a formal motion to produce?

52. What are the corrosion and activation products present in secondary coolant or other liquid effluent?

a. Is cobalt-60 ever present in the secondary coolant or other liquid effluent?

b. If so, why, in what quantities, and how often.

53. Department of Transportation investigation dated December 4, 1980, indicates that Applicant apparently missed radioactive contamination of 100,000 counts per minute during its radiation check of the truck used for shipment of spent fuel. That truck was loaded in an area quite close to unrestricted public access areas, and passed through highly populated areas.

a. Does Applicant contend that the shipment was not contaminated when it reached GE at Vallecitos?

b. Does Applicant contend that the shipment was not contaminated when it was at UCLA?

c. On what facts does Applicant base its answers to 53 a and b?

d. What records document Applicant's answers to 53 a and b and c?

e. Will Applicant produce said documents absent a formal motion to produce?

54.a. Did Applicant notify Joe Karbus, Los Angeles County radiation protection official, prior to the allegedly contaminated shipment?

b. Did Applicant notify any other governmental radiation protection official, or other public safety official, either in Los Angeles or along the route of transport, prior to the allegedly contaminated shipment?

c. If the answer to 54 b is affirmative, precisely who was notified?

d. Did Applicant notify Joe Karbus subsequent to being notified that the shipment had been allegedly found to be contaminated?

e. Did Applicant notify any other governmental radiation protection official, or other public safety offocial, either in Los Angeles or along the route of transport, subsequent to being notified that the shipment had been allegedly found to be contaminated? If so, who was notified?

f. If the answer to 54 a, b, d, or e is negative, please explain why those officials were not notified?

g. What records exist of any such notification? Will Applicant produce said records absent a formal motion to produce?

55. Is it Applicant's contention that it was not the cause of the contamination of the truckbed and tiedowns? If yes,

a. Please indicate how Applicant believes contamination episode occurred, precisely.

b. Please detail what facts Applicant has in its possession to support or contradict the answers to 54 and 54 a above.

c. Please specify what documents are in Applicant's possession which support or contradict the answers to 54, 54 a and b; will Applicant produce said documents absent a formal motion to produce?

56. The Department of Transportation study dated December 4, 1980, mentions a report that the driver of the allegedly contaminated truck allegedly picked up an unauthorized passenger, a woman friend, who travelled in the truck cabin along with the drivers.

a. Does Applicant have any information to confirm or deny that report, and, if so, please provide all such information.

b. If the Applicant has any information which confirms the report, what efforts did Applicant make to locate and notify that woman subsequent to learning about the alleged contamination so that she might be checked for possible contamination?

c. Were the driver(s) wearing film badges or other radiation protection devices? If so, what data exists regarding their radiation exposures?

57. The Valley News of June 22, 1980, reports that the truck went from UCLA down Wilshire Boulevard and "onto first the San Diego and then the Santa Monica freeways." This does not appear to be the route most prudent for minimizing public radiation exposures from a contaminated shipment.

a. Is the Valley News report correct about the route traveled?

b. Did Applicant have anything to do with choosing the route the truck was supposed to go? If so, which route was the chosen route?

c. If the truck went by a different route than the chosen route, does Applicant have any information as to why the different route was followed? If so, please specify all such information.

d. If that was the route chosen by Applicant, why did it choose a route that involved so much additional travel through populated area?

e. Once Applicant was notified of the alleged contamination, did it take any radiation readings along the route, at least the route travelled through campus and through Westwood Village, to see if any liquid contaminant spilled along the route? If so, what were the results of such measurements? If not, why were not such measurements made?

58. The Department of Transportation study indicates the truck stopped at least one night in Las Vegas. Precisely where was the truck parked while it stayed in Las Vegas?

a. After being notified of the alleged contamination, did Applicant notify Las Vegas officials or any other officials and recommend any radiation monitoring of the area where the truck had been parked?

b. If the answer to 58 a is affirmative, what were the results of the monitoring.

c. If the answer to 58 a is negative, why did it not so notify officials and so recommend such monitoring?

d. Is Applicant aware of any rainstorm through which the truck may have passed in its allegedly contaminated condition before reaching Vallecitos? If so, where? Did it stop anywhere where it encountered rain? Were any radiation readings subsequently taken there to see if the rain washed off any of the contaminant into unrestricted areas? If so, what were the results of said monitoring?

e. The DOT study indicates the driver said he had a faulty airline for his brakes and therefore stopped in Las Vegas, but also reports an indication that this may not be true. What information does Applicant possess that can shed light on where the truck was while in Las Vegas, for how long, and where its drivers, potentially carrying radioactivity into unrestricted areas, were during the time they were there?

f. The shipment apparently left UCLA on a Saturday morning. Was it intended for the drivers to drive straight through to Idaho Falls and deliver the material Saturday or Sunday, or was it intended all along that the transport involve stopover? If the latter, would it not have been more prudent from a radiological protection standpoint, knowing what is now known about the contamination, for the most direct, quickest, and least populated route to have been taken?

59. Precisely why did Applicant choose not to monitor the truck for Cobalt-60?

60. How does Applicant explain its apparent inability to detect contamination of 100,000 cpm?

61. Please identify all documents in Applicant's possession related to the allegedly contaminated shipment, including but not limited to, all written loading and pre-loading procedures, all correspondence with DOT investigators or NRC officials, all forms necessary to fill out prior to the shipment and subsequent to the reports of contamination, all written notification of radiation or other public safety officials in LA or along the route, all subsequent notification of officials after being informed of the alleged contamination, all correspondence with the trucking company, the company from which the cask was borrowed (GE at Vallecitos Intervenor understands), the facility to which the shipment was taken (Intervenor understands it was Exxon Nuclear at Idaho Falls), all other governmental agencies from which or to which documents related to the incident were transmitted, and all other records of the incident in question.

a. Will Applicant produce said documents absent a formal motion to produce?

62. What is Applicant's precise and complete definition of ALARA? Does Applicant have other definitions for ALARA?

a. What documents contain the above definitions? Will Applicant produce said documents absent a formal motion to produce?

63. How does Applicant assess compliance with ALARA? What standard does Applicant use?

a. What documents contain the above standards or measures or means of assessment. Will Applicant produce said documents absent a formal motion to produce?

64. Applicant's answer to NRC Question 2, answered on 8-27-80, states that if the average value of dosimeters within 300 feet of the stack is attributed entirely to reactor operations and scaled to 1979 operating level, the beta + gamma dose "is about 97 mr/yr."

a. Please estimate the beta + gamma dose if one takes the highest dosimeter location within 300 feet of the stack and scales it to maximum permitted operating level under the current terms of the license.

65. Will Applicant produce '1980 Annual Report to the NRC' absent a formal motion to produce?

66. The Los Angeles Times of 4/12/81 reports that the Applicant's reactor at Berkeley emits Argon-41. A press statement by UC Berkeley Chancellor Heyman referred to a number of studies and calculations done about the Argon emission. Please identify all such studies, calculations and other documents in Applicant's possession and whether Applicant will produce them absent a motion to produce.

INTERROGATORIES AS TO CONTENTION VII

"Operational Unreliability"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories. If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Within the context of these interrogatories, the term "unusual episode" and/or "Unusual event" will include but not be limited to:

a. abnormal occurrences

b. unscheduled shutdowns

c. unanticipated shutdowns

d. scrams

e. reportable occurrences

f. accidents

g. radiation or radioactivity spills, leaks, or contamination episodes

h. excursions

i. transients

j. non-standard radiation exposures or suspected exposures to personnel or visitors

k. equipment malfunctions with possible effects on operational reliability or safety

l. personnel errors with possible effects on operational reliability or safety

m. violation of operating procedures

n. high, out-of-ordinary radioactivity or radiation levels

o. and all other incidents outside of the normal operations of the reactor which might affect the operational reliability of the reactor and its supporting facilities

Which of the above-mentioned terms referring to "unusual episodes" or "unusual events" are utilized by Applicant?

4. Which terms are not utilized by Applicant and how are those occurrences or events described?

5. Indicate all other terms utilized by Applicant and not identified in answer to interrogatories 3 and 4 that also refer to "unusual episodes or events" at the reactor and supporting facilities.

6. What are the Applicant's precise, formal definitions of each of the terms identified in answer to interrogatories 3,4 and 5?

7. What are the applicant's sources for these formal definitions?

a. If they are Nuclear Regulatory Commission (NRC) definitions, what specific NRC documents do they come from?

b. If these definitions have non-NRC origins, what are those origins, and from what specific documents are they taken?

c. Will Applicant produce copies of all such documents absent a formal motion to produce?

8. Does the Applicant have written operating procedures for reactor personnel to follow in the event of the occurrence of each of the kinds of "unusual episodes" identified in interrogatories 3,4 and 5?

a. For each type of "unusual episode" for which Applicant has written operating procedures, what are the titles and date of compilation of <u>each</u> such written operating procedure?

b. Will Applicant furnish, absent a formal motion to produce copies of each and every set of written operating procedures for responding to "unusual episodes," aside from those pertaining to the Physical Security Plan?

c. For which types of "unusual episodes"does a written procedure <u>not</u> exist, and why?

9. Where does the Applicant keep copies of the written operating procedures described in interrogatory #8?

a. Are these written operating procedures readily accessible to all reactor personnel involved in operating the reactor?

b. How do reactor personnel obtain access to the copies of

these written procedures?

c. What specific efforts have been made by the Applicant to ensure that all reactor personnel are familiar with the written operating procedures described in interrogatory #8?

10. Have reactor personnel ever actually undertaken any of the written proper operating procedures described in interrogatory # 8?

a. If so, what specific actions have been taken in response to what specific"unusual episodes"?

b. Have these actions resulted in a decrease in the number of "unusual episodes"?

c. Have these actions resulted in a decrease in the severity of "unusual episodes" which still occur?

d. If the actions undertaken in accordance with the written operating procedures in interrogatory #8 have resulted in a decrease in neither the number nor the severity of unusual episodes which have occurred, then is it Applicant's contention that all of the unusual episodes which have occurred are normal occurrences at a reactor of this type?

e. If the answer to d above is affirmative, please provide all facts in Applicant's possession to support that assertion, identify all documents in which those facts are found, and indicate whether Applicant will produce said documents absent a formal motion to produce?

11. Has the Applicant undertaken any administrative actions in response to the occurrence of any unusual episode?

a. If so, what type(s) of administrative actions have been so undertaken by the Applicant?

b. What actions have been undertaken by Applicant in an attempt to reduce the number of unusual episodes occurring at the reactor?

12. To exactly which governmental organizations does the Applicant send written reports of the types of "unusual events" specified in interrogatories 3,4 and 5?

a. Will Applicant produce said reports absent a formal motion to produce?

13. Are there any written forms the Applicant is required to complete by some governmental organization subsequent to the occurrance of an "unusual episode" in the course of reactor operation, but which Applicant only must keep on file in its offices instead of having to mail to the governmental organization in question?

a. If so, exactly what forms are so required and by what particular governmental organizations?

b. Will Applicant produce said records absent a formal motion to produce?

14. Does the Applicant maintain written records of the occurrence of any "unusual episode" at the reactor which are not required specifically by a particular governmental organization?

a. If so, exactly what records does Applicant maintain?

b. Will Applicant produce said records absent a formal motion to produce?

15. What additional specific written records does the Applicant

posess, not identified in interrogatories 12-14, concerning the occurrence of <u>each</u> type of "unusual event" specified in interrogatories 3,4 and five? Will Applicant produce said records absent a formal motion to produce?

INTERROGATORIES AS TO CONTENTION VIII

"Radiation Exposures in Case of Major Accident"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. In preparing Attachment B of the Argonaut Safety Analysis Report contained in Section III of the Application, precisely what radioactive core inventory was assumed? Please provide answers in curies.

a. What total core inventory was assumed?

b. What inventory was assumed for the volatile fission products? (as referred to in Application at page III/B-1: "The volatile fission products are bromine, krypton, iodine, and xenon. Hence the fission product chains which must be considered are of atomic masses 82 to 90 and 131 to 135.")

c. What inventory was assumed for the non-volatile fission products?

d. In the above-mentioned analysis, what were considered to be the non-volatile fission products?

e. In the above-mentioned analysis, were any fission products besides bromine, krypton, iodine and xenon considered to be volatile? If so, specify which isotopes were so considered.

f. What specific inventory was assumed for each of the iodine isotopes?

g. What specific inventory was assumed for bromine?

h. What specific inventory was assumed for krypton?

i. What specific inventory was assumed for xenon?

j. What specific inventory was assumed for each of the strontium isotopes?

k. What specific inventory was assumed for cesium?

4. a. What specific inventory was assumed for plutonium?

b. What inventory was assumed for the activation and corrosion materials in the primary coolant?

c. What inventory was assumed for induced radioactivity in the reactor materials and surrounding materials?

5. What conditions were assumed in order to produce the inventory figures used for the analysis in Attachment B of Section III of the Application?

a. What precisely was meant by the statement on page B-1 of the attachment that the "reactor is assumed to have been operated continuously at the 10 kw power level long enough to have attained equilibrium concentrations of the relatively short-lived fission products, i.e., the iodine, bromine, and krypton isotopes." How long was the reactor assumed to have run? How long does it take to reach equilibrium concentrations of those isotopes?

6. What written materials (calculations, workbooks, analyses, source materials, computer printouts) document Applicant's answers to interrogatories 3, 4, and 5? Will Applicant produce said documents absent a formal motion to produce?

7. Page III/8-1 of the Application indicates that the calculations in Attachment B are "based upon a steady state inventory at 10 kwt" and argues that "in view of the current restriction of the UCLA Reactor operating hours to 5% of the year, the maximum average power is now 5 kwt, a factor of two less than the 10 kwt used in the original calculations."

a. Please specify all facts and calculations upon which Applicant bases the above assertion that maximum core inventory for the reactor under current restrictions at 100 kwt is half that of the volatile inventory assumed for the reactor at 10 kwt in the original 1960 calculations?

b. Please identify all documents in Applicant's possession or of which Applicant is aware that support or contradict the quoted statement above and the answer to 7a.

c. Will Applicant produce all documents identified in 7b above which are in its possession absent a formal motion to produce?

d. What is Applicant's contention as to how long the reactor must run continuously at 10 kwt to build up a "steady state inventory" of the volatile fission products analyzed in Attachment B?

e. What is Applicant's contention as to how long the reactor must run continuously at 100 kwt to build up an equal inventory?

f. What is Applicant's contention as to how long the reactor must run at 100 kwt 8 hours per day five days a week to build up an equal inventory?

g. What is Applicant's contention as to how long the reactor must run at 100 kwt 16 hours per day five days a week to build up an equal inventory?

h. Please provide all calculations upon which answers 7d through 7g above are based.

i. What documents, tables, computer runs, studies, articles, books, records of experiments, or other written source material are the answers to 7d through 7g based upon?

j. Will Applicant produce the documents identified in response to 7i above absent a formal motion to produce?

8. Would anything in the reactor's current license or technical specifications prohibit operation under the following conditions, so long as the total operation in any one year did not exceed 43,800 kilowatt (thermal) hours?

a. operating more than 5% of any given week at 100 kwt

b. operating more than 5% of any given month at 100 kwt

c. operating 16 hours a day at 100 kwt

d. operating 24 hours a day at 100 kwt

e. operating 6 days a week at 100 kwt

f. operating 7 days a week at 100 kwt

g. operating 7 days a week for 24 hours a day for 18 days straight at 100 kwt

h. operating 7 days a week for 24 hours a day for the first 18 days of one year and the last 18 days of the previous year at 100 kwt.

i. operating at 25 kwt for 73 days straight, 24 hours per day

j. operating at 25 kwt for the last 73 days of one year and the first 73 days of the next year.

9. If the answers to 8 a through j indicates that any of those operating conditions would not be permitted under the current license or technical specifications, for each item a through j so indicated, please specify what provision of the license or technical specification is the source of the limitation.

10. In Attachment B of the Section III of the Application, did the 1960 analysis reproduced therein average power and operating time over a year's period in order to make its computations, or did it rather consider maximum operation for a portion of a year?

11. On what basis did Applicant conclude that only 10% of the volatile fission products would be released in the most severe accident considered credible?

a. What studies, experiments, calculations, investigations, and other documents in Applicant's possession support or contradict the assumption of only a 10% volatile fission product release?

b. Will Applicant produce said documents absent a formal motion to produce?

12. On what basis did Applicant conclude that none of the non-volatile fission products would be released in the most severe accident considered credible?

a. What studies, experiments, calculations, investigations, and other documents in Applicant's possession support or contradict the assumption of zero non-volatile fission product release?

b. Will Applicant produce said documents absent a formal motion to produce?

13. On page III/B-1 of Application it is stated that the assumption of 10% volatile release and zero non-volatile release "is consistent with the reasonable assumption made here that the incident is not violent enough to blow off the top and side biological shields so as to cause an intense spray of water-steam-

radioactivity mixture into the building air."

a. Please provide all facts in Applicant's possession which show that that assumption indeed is reasonable.

b. Please indicate all documents which support or contradict that statement and the answer to 13a above.

c. Will Applicant produce said documents absent a formal motion to produce?

14. Does Applicant have knowledge as to whether in the Borax self-destruct experiment the biological shields were blown off and a spray of water-steam-radioactivity released?

a. If the answer to the above is affirmative, please provide all facts in Applicant's possession as to the results of that Borax experiment.

b. Please identify all documents that support or contradict Applicant's answer; will Applicant produce said documents absent a formal motion to produce?

15. What facts are in Applicant's possession that indicate that should the maximum earthquake possible at the site occur, reactor biological shields would stay in place?

a. What documents does Applicant possess that support or contradict the above answer; will Applicant provide said documents absent a formal motion to produce?

16. What facts are in Applicant's possession that indicate that should a fire occur near the reactor core, coupled with fuel damage, that only 10% of the volatile fission products could escape and none of the non-volatiles?

a. What documents does Applicant possess that support or contradict

the above answer; will Applicant produce said documents absent a formal motion to produce?

17. Has Applicant in its possession any additional facts or calculations which estimate radioactivity releases and consequential doses in case of a maximum accident? If so,

a. Please detail with specificity all analyses which have been done, their methodology, and their conclusions.

b. Please describe all documents which relate to said analyses and calculations and facts and whether Applicant will produce said documents absent a formal motion to produce.

18. What is Applicant's most current estimate of the maximum radioactive core inventory that can be contained within the reactor at any one point during the proposed license period given the proposed license and technical specifications limitations?

a. What inventory is assumed for the volatile fission products?

b. What inventory is assumed for the non-volatile fission products?

c. What specific inventory is assumed for each of the iodine isotopes?

d. What specific inventory is assumed for bromine?

e. What specific inventory is assumed for krypton?

f. What specific inventory is assumed for xenon?

g. What specific inventory is assumed for each of the strontium isotopes?

h. What specific inventory is assumed for cesium?

19.a. What specific inventory is assumed for plutonium?

b. What inventory is assumed for the activation and corrosion materials in the primary coolant?

c. What inventory is assumed for induced radioactivity in the reactor materials

and the surrounding materials?

20. What calculations, charts, tables, computer printouts and other written materials exist in Applicant's possession which document the answers to interrogatories 18 and 19?

21. What conditions were assumed in answering the questions in 18 and 19?

a. How many total megawatt days over how many years had the fuel been assumed to be in the reactor?

b. How many hours per day for how many days per week over how many continuous weeks had the reactor been assumed to run and at what power?

22. a. How many megawatt days has the reactor run to date?

b. How many megawatt days could the reactor run if its 20-year license renewal were granted and it ran and full operating authorized level for that period (how many megawatt days in addition to those already run)?

c. How many megawatt days has the fuel now in the reactor produced? If parts of the fuel loading have different histories, so indicate.

d. How many megawatt days are necessary before reloading is necessary? What is the maximum number of megawatt days for maximum fuel burnup?

e. What is the fuel inventory-after maximum burnup-of the relatively long-lived isotopes (e.g. strontium-90 and cesium-137) given past history of the fuel and limit on future operations of 438 kwh/year over the next 20 years.

23. a. What is the equilibrium time for the principal iodine isotopes at continual operation?

b. What is the I-131 inventory for this reactor after 36 consecutive days of operation 24 hours per day?

c. What would be the I-131 inventory for this reactor on a Friday afternoon after 21 weeks of running at 100 kw 8 hours a day five days a week?

d. What would be the I-131 inventory for this reactor on a Friday evening after a 16-hour run preceded by 10 weeks of running at 100 kw 16 hours a day five days a week?

e. Please show all calculations on which the answers to 22 and 23 are based.

f. Please identify all documents upon which the answers to 22 and 23 are based. Will Applicant produce said documents absent a formal motion to produce?

24. Please answer questions 18 and 19 for the following conditions, all predicated on the present operating history of the reactor and the end of the requested twenty-year license renewal period, or maximum fuel burnup, whichever comes first, given current restriction on operating time and power.

a. 36 consecutive days of operation 24 hours per day, 100 kw power

b. 21 weeks of running at 100 kw, 8 hours a day, five days a week, at the end of an 8 hour run and a five-day week.

c. 10 weeks of running at 100 kw, 8 hours a day, five days a week, at the end of an 8 hour run and a five-day week.

d. 21 weeks of running at 100 kw, 8 hours a day, five days a week, at the end of a 16 hour run and a five day week.

e. 10 weeks of running at 100 kw, 8 hours a day, five days a week, at the end of a 16 hour run and a five day week.

25. Please show all the calculations upon which the answers to 24 above were based.

a. Please indicate all documents upon which those answers were based.

b. Will Applicant produce said documents absent a formal motion to produce?

26. Does Applicant have any information in its possession as to % of volatile and nonvolatile fission products considered to be released into environment in accident scenarios at other reactors?

a. If so, please detail all such information, including the hypothesized percents and the reactors in question.

b. If the answer to 26 is affirmative, please indicate all documents in Applicant's possession which provide said information.

c. Will Applicant produce said documents absent a formal motion to produce?

27. Does Applicant currently contend only 10% of the volatiles and none of the non-volatiles could credibly escape in a maximum accident?

a. If so, what facts form the basis of that contention?

b. If not, what new estimates does Applicant have and what facts and documents form the basis of those new estimates? (Please give the new percentages if new estimates do exist). Will Applicant produce said documents absent a formal motion to produce?

28. What information does Applicant possess regarding properties of the reactor or the fuel to minimize fission product escape?

a. Precisely what capabilities of the fuel are there or coolant that would minimize such release?

b. What documents support or contradict the information provided in answer to 28 and 28a; will Applicant produce said documents absent a formal motion to produce?

29. Page 62 of the 1960 Hazards Analysis makes reference to the reactor running at 20% operating time (this when operating limit was 10 kwt) in discussing Argon-41 releases. Since the section of the 1980 Safety Analysis Report dealing with releases in cases of accident is a verbatim copy of a part of the 1960 Hazards Analysis, did the accident analysis so included assume 100% operating time at 10 kwt over the year or 20% average operating time over the year or some other figure for operating time?

30. On what basis are the estimates of leak rate from the building made in Attachment B of Section II of the Application?

a. Has the leak rate from the building ever been tested?

b. If so, what were the results of those tests, what documents exist about those tests, and will Applicant produce said documents absent a formal motion to produce?

c. Was it assumed that the reactor room and /or reactor building remained intact in assuming the various leak rates in Attachment B?

d. What would be the fission product escape rate if the reactor room and/or reactor building were severely damaged (for instance in a steam explosion or an earthquake)?

e. Are the leak rate estimates included in Attachment B merely repititions of the leak rate estimates made in the late fifties for the University of Florida reactor and reactor structure?

f. What documents are in Applicant's possession that support or contradict the answers in 30 a through e above? Will Applicant produce said documents absent a formal motion to produce?

31. Does Applicant contend that no non-volatile fission products would escape the reactor core should the following types of accidents occur:

a. a Windscale-type uranium and/or graphite fire

b. a Borax-type power excursion and steam explosion

c. an earthquake which damaged the fuel and was coupled with boiling of primary coolant and steam formation

d. explosion in reactor core or nearby, caused by accident or intent.

32. Please provide all facts which support your answer to interrogatory 31.

a. What documents are in Applicant's possession which support or contradict the information provided in 31; will Applicant produce said documents absent a formal motion to produce?

33. Please provide Applicant's estimates of fission product release (both for non-volatiles and volatiles and unless Applicant contends none of one or the other form of fission products can be released in such a scenario) for each of the types of accidents described in 31 above.

a. What documents provide facts which support and/or contradict the estimates given to 33 above? Will Applicant produce said documents absent a formal motion to produce?

34. The analysis in Attachment B included in the current Application was written at least 20 years ago, when the reactor was in its own 2-story building. Since then considerable construction has essentially enveloped the reactor structure. How does this affect the estimates made in Attachment B?

a. What new estimates have been made by Applicant or of which Applicant is aware that take into consideration the current configuration of buildings surrounding and encompassing the reactor? (By estimates, we refer to estimates of leak rates, public exposures of radiation, total population exposed, concentration of radioactivity in air on deposited on floors, walls, ceilings, etc. within the building).

b. Please specify how these estimates were made, and what the resulting estimates are.

c. Please identify all documents that record these estimates and their method of production; will Applicant produce said documents absent a formal motion to produce?

35. What would be the highest doses to people within Boelter Hall given all the assumptions in Attachment B except that the building was as it was in 1960?

a. Please show all calculations leading to your answer.

b. Please identify all documents that record facts related to your answer; will Applicant produce said documents absent a formal motion to produce?

36. What would be the effect of the building ventilation system in case of an accident at the reactor?

a. If the reactor room itself remained intact, but the stack shut down automatically and a steam explosion occurred filling the reactor room with overpressure and radioactive steam?

b. If the reactor room did not remain intact and a steam explosion occurred involving radioactive steam?

c. for the conditions outlined in a and b above, but with a core fire instead of a steam explosion.

d. Please provide all calculations upon which your answers are based.

e. Please identify all documents that support or contradict your answers to 36 a through d; will Applicant produce said documents absent a formal motion to produce?

37. What is the effect on the surface deposition estimates found in Appendix B of assuming contamination of parts of the interior of Boelter Hall?

a. Please provide all calculations.

b. Please identify all documents that support or contradict your answer; will Applicant produce said documents absent a formal motion to produce?

38. What attempt has Applicant made to update the estimates contained in Appendix B with new dispersion models, dose rate models, dose factors, and other similar more current data?

a. Please indicate all new models and data reviewed and the results of utilizing these new models and data.

b. What documents exist in which these models and data are contained; will Applicant produce said documents absent a formal motion to produce?

39. Page II/B-6 of the Application estimates an 1800 rep exposure to the thyroid to a member of the public at 15 meters under certain air conditions.

a. Does Applicant contend that its estimate contained in its Application for relicensing is incorrect?

b. If the answer to 39 a is affirmative, what does Applicant contend is the correct estimate?

c. If 39 b has been answered, please provide all calculations and facts upon which that new estimate has been made. In addition, please identify

all documents upon which those calculations and facts are based or in which they are contained; will Applicant produce said documents absent a formal motion to produce?

40. Given the estimate of 18.0 rep to the thyroid found in the Application, what thyroid dose would result if the following assumptions upon which it is based were changed? Please answer each individually.

a. Rather than 10% volatile release, 50% volatile release.

b. Rather than 10 % volatile release, 100 % volatile release .

c. Rather than the volatile inventory at 100 kwt under current operating limits being considered half that of the volatile inventory assumed in the analysis at 10 kw, assume that under current conditions the volatile inventory would be 5 times that of the reactor at 10 kw.

d. The same as c above but the volatile inventory 10 times that assumed in the analysis in Attachment B.

e. Rather than the leak rate assumed in Attachment B, based on an assumption of no damage to reactor room or building, assume a leak rate based on such damage (from explosion or earthquake).

f. Rather than the radioactivity concentration in air assumed in the analysis in Attachment B, based on an assumption of a leak of radioactivity from the reactor building to the outside and dispersing in the outside air, assume maximum possible concentration of radioactivity (with buildup) of leak into the nearest parts of Boelter Hall to the reactor that are occupied by the public.

g. same as f, but with damage to NEL structure due to explosion or earthquake, thus increasing leak rate.

h. Rather than the dose from surface deposition assumed in the

analysis in Attachment B, based on deposition outdoors, assume interior deposition of the interior of Boelter Hall and maximum deposition on the surfaces in unrestricted areas of Boelter where highest deposition rates are likely.

i. Same as h, but assuming leak rate consistent with physical damage to NEL structure from explosion or earthquake.

j. If conditions a,c,f, and h existed together.

k. If conditions b,d,e,g, and i existed together.

l. Please provide all calculations and facts upon which answers 40 a through k are based.

M. Please identify all documents upon which the answers to interrogatories 40 a through l are based; will Applicant produce said documents absent a formal motion to produce?

41. Assuming the severe inversion conditions upon which the 1800 rep thyroid dose was calculated in the Attachment B, but assuming some release on non-volatile fission products, please estimate external beta dose, gamma dose, thyroid dose, and bone dose assuming 10% volatile release and the other conditions assumed in Attachment B except:

a. 1% strontium release

b. 10% strontium release

c. 1% non-volatile release

d. 5% non-volatile release

e. 10% non-volatile release

f. 50% non-volatile release

42. Please provide all facts and calculations upon which the answers to 41 a through f are based. Please indicate all documents in which those facts and calculations are contained; will Applicant produce said documents absent a

formal motion to produce?

43. Please answer interrogatory 41 a through f assuming that the non-volatile fission product inventory at 100 kwt under current operating restrictions and the assumption of an additional twenty years of operation and with past operating history is:

a. 5 times that of the reactor at 10 kwt under the operating conditions assumed in Attachment B.

b. 10 times that of the reactor at 10 kwt under the operating conditions assumed in Attachment B.

44. Please provide all facts and calculations in Applicant's possession upon which the answers to 43 a and b are based.

a. Please indicate all documents which support or contradict those answers; will Applicant produce said documents absent a formal motion to produce?

45. Please answer interrogatory 40 for external beta dose, gamma dose, and bone dose.

46. Assuming "x" inventory of non-volatile fission products and "y" percent release of those fission products, by what factors would the (1) external beta dose, (2) gamma dose, (3) thyroid dose, (4) bone dose increase given the following individual assumptions:

a. rather than the leak rate assumed in Attachment B to the outside of the reactor structure, assume a leak rate based on damage (from explosion or earthquake)

b. rather than radioactivity concentration in air assumed in the analysis + surface deposition rate in Attachment B, based on an assumption of a leak of radioactivity from the

reactor building to the outside and dispersing in the outside air, assume maximum possible concentration of radioactivity (with buildup) of leak into the nearest parts of Boelter Hall to the reactor that are occupied by the public.

c. same as b, but assuming a leak rate based on damage to the reactor room and NEL facilities caused by explosion or earthquake

47. Please provide all calculations and facts upon which answer to interrogatory 46 is based.

a. Please identify all documents upon which answers are based; will Applicant produce said documents absent a formal motion to produce?

48. Please indicate external beta dose, gamma dose, thyroid dose, and bone dose given the combination of the following assumptions (give only one figure for beta, one for gamma, one for thyroid, and one for bone dose): severe inversion, eight hour exposure, fuel having reached maximum burn-up or year 2000 (whichever comes first), 43,800 kilowatt (thermal) hours production each year through the year 2000, reactor having run at time of accident 24 hours a day at 100 kw power for 36 consecutive days, 50% volatile release and 50% nonvolatile release, surface deposition and air concentration based on leak into nearest unrestricted area inside Boelter and a leak rate based on a damaged NEL facility from explosion or earthquake. This will give base figures which can be reduced by specific factors based on estimates of realistic maximum credible situations.

49. Please provide all calculations upon which the answer to 48 was based. Specify what documents support those calculations and whether Applicant will produce said documents absent a formal motion to produce.

50. What conditions, of the types listed in interrogatory 48, does Applicant contend are the maximum credible for a maximum accident at its reactor? Be specific.

a. What facts and calculations support Applicant's answer?

b. What documents form the basis for Applicant's answer?

c. Will Applicant produce said documents absent a formal motion to produce?

51. If Applicant has been unable to provide any/one or more of the calculations or estimates requested in the interrogatories above, on what bases and utilizing what facts does Applicant intend to rely to prove that

a. Its dose estimates in Attachment B of the Application are correct

b. Its dose estimates in Attachment B are incorrect, but by being too high

c. Even if the dose estimates in Attachment B were correct, they would indicate no unacceptable hazard should such an accident occur

d. Even if the dose estimates in Attachment B were substantial underestimations, no unacceptable hazard should occur if such an accident occurred.

e. No accident is possible that could cause any such doses.

52. Please identify all documents in Applicant's possession that support or contradict its answers to interrogatories 51 a through e.

a. Will Applicant produce said documents absent a formal motion to produce?

INTERROGATORIES AS TO CONTENTION IX

"Inadequate Maintenance and Calibration"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

   a. Please identify each and every such person.

   b. Please state the number of each interrogatory with respect to which that person was consulted.

   c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Please identify with specificity each and every radiation and radioactivity monitor and detector utilized with respect to the NEL reactor used in the period from 1960 to the present (by this interrogatory we refer to all TLDs, film badges, liquid effluent and gaseous effluent monitors, GM counters, hand and foot counters, and all other radiation and radioactivity monitering devices employed by NEL). As to each monitor and detector identified, state:

a. The name of its manufacturer;

b. Its make and model;

c. Its present location;

d. The kind of radiation or radioactivity it is designed to detect or monitor;

e. Its range of sensitivity (high and low threshhold);

f. Its accuracy and reliability;

g. Whether the device is still in use by NEL.

4. Please detail with specificity each and every document which provides information relative to the information requested and given in interrogatory no. 3, and as to each such document, state:

a. The location of said document;

b. The name, address and phone number of the custodian of said document;

c. If Applicant will make such document available to Intervenor without a Motion to Produce.

5. For each monitor and detector identified in response to interrogatory no. 3, please state:

a. At what interval the monitor or detector requires calibration;

b. The document or documents that contain the calibration requirement;

c. What method, specifically, is used or was used in the past to calibrate said monitor or detector;

d. What document or documents contain those calibration methods;

e. If the original manufacturer's specifications and calibration methods exist today in NEL's possession, and if so, identify said documents with specificity; if not, please explain why not;

f. What logs and records exist for the calibration of said device, and for what period said logs and records exist;

g. State the name, address and phone number of the custodian of each log and record identified in response to interrogatory no. 5.(f);

h. State the location of each log and record identified in response to interrogatory no. 5(f);

i. Identify with specificity any instance in which said monitor or detector was not calibrated at the required interval and identify any documents or records relative to that instance;

j. Identify with specificity any calibration error (including errors in calibration curves) that was determined or discovered subsequent to the calibration itself and identify any and all documents or records relative to that calibration error, stating the size of the calibration error.

k. Will you produce all documents identified in response to Interrogatory 5 & its subparts without a formal motion to produce?

6. Inspection report 75-01 indicates that an error had been found in the calibration curve for the Argon-41 monitor. If the following questions have not been answered in interrogatory no. 5 above, please state:

a. If there was an error in the calibration curve;

b. If there was an error in the calibration curve, explain the cause of the error and specify its magnitude;

c. If there were any other error(s) in the monitoring of the Argon emissions;

d. If there were other error(s) in the monitoring of the Argon emmissions, state the nature of the other error(s), the cause(s) and the magnitude(s).

7. Pages 6-7 of Inspection Report 75-01 notes that the document creating the calibration curve and the detector response to Argon-41 versus C-14 no longer exists. In reference thereto, please state:

a. What happened to this document;

b. If any attempt to recreate the curve has been made, and if so, what the results were;

c. If there are any documents relating to this attempt, identify them with specificity.

d. Will you produce these documents without a formal motion to produce.

8. Inspection Report 75-01 indicates that the radioactive gaseous effluent monitor had not been calibrated at the interval required by the Technical Specifications. In reference thereto, please state:

a. The total magnitude error finally determined to have existed in reported Argon-41 emissions when recalibration, new calibration curves, and new instrumentation were in place;

b. State for how long a period the erroneous Argon-41 emissions readings were taken to be correct.

9. The Docket 50-142 Document record log for the UCLA reactor indicates problems with the Argon monitor prior to 1974. Please describe any and all problems with the Argon monitor encountered prior to 1974 and identify all documents detailing such problem, and whether you will produce said documents without a formal motion to produce.

10. Are Applicant's personnel familiar with the calibration and maintenance requirements for the NEL facility?

11. Are the calibration and maintenace requirements for the NEL facility documented in a written form?

12. If the answer to interrogatory no. 11 is in the affirmative, for each such document, state:

a. The identity of each document;

b. Where these documents are kept;

c. How NEL personnel gain access to these documents.

d. Whether you will produce said documents without a formal motion to produce.

13. What methods exist for teaching, reminding and

enforcing the requirements listed in interrogatory no. 10?

14. Are these methods for teaching, reminding and enforcing these requirements documented in a written form?

15. If the answer to interrogatory no. 14 is in the affirmative, state:

a. The identity of each document;

b. The name, address and phone number of the custodian of each such document;

c. Where these documents are kept.

d. Whether you will produce said documents without a formal motion to produce?

16. Please detail each and every disciplinary action taken due to failure of personnel to do calibration or maintenance at required intervals or to have done calibration or maintenance adequately from 1960 through the present, and identify any records that document said action and whether you will produce said documents without a formal motion to produce?

17. Is the maintenance log for all years prior to 1974 missing?

18. If the answer to interrogatory no. 17 is in the

affirmative, state:

a. If Applicant has ever found this log;

b. If Applicant has not found this log, has Applicant determined how it was lost;

c. If any employee of NEL has any information, written or otherwise, which might tend to suggest that the maintenance log for years prior to 1974 was deliberately lost, and if so, state:

(1) The name, address and telephone number of each and every person who might have such information; and

(2) The nature of such information, in detail.

19. Please provide the most current address and phone number available for former NEL employees MR. JAMES F. BROWER and DAVE N. JONES.

20. Did the leaving of former NEL employees, MR. BROWER and MR. JONES at the time of the loss of the log have anything to do with the loss of the maintenance log referred to in interrogatory no. 17?

21. If the answer to interrogatory no. 20 is in the affirmative, please detail in full the connection between the leaving of MR. BROWER, and MR. JONES, and the loss of the

maintenance log referred to in interrogatory no. 17.

22. Does any NEL staff person or administrative committee member know of any indication that the maintenance log was deliberately lost to hide or cover up inadequate maintenance or calibration or other problems related to maintenance or calibration?

23. If the answer to interrogatory no. 22 is in the affirmative, please detail in full any and all such indications and who has knowledge of them.

24. Exactly what does the Applicant mean by the "heat balance" calibration, what is it for, how is it done, and why is it important?

25. Regarding the "heat balance" calibration, please state:

a. How long it takes;

b. What the consequences could be, including the most severe physically possible, if "heat balance" calibrations are not done or are grossly in error (in detail);

c. If any problems have ever been encountered, from 1960 through the present, in conducting the heat balance;

d. If the answer to interrogatory no. 25(c) is in the affirmative, state:

(1) Precisely what those troubles were or are;

(2) Identify each time these troubles have been manifest;

(3) The cause of the troubles;

(4) What has been done to correct them;

(5) What significance these problems could indicate for reactor operation;

e. All instances when the "heat balance" calibration was not done at the required intervals;

f. What records exist of all "heat balance" calibrations, calibration procedures, requirements, results, methods and problems thereto;

g. The location of the records identified in response to interrogatory no. 25(f);

h. The name, address and phone number of the custodian of each record identified in response to interrogatory no. 25(f).

i. Whether records identified in response to No. 25f will be provided without a formal motion to produce.

26. Inspection Report 68-1 states on pages 5-6 that "on several occasions ... nuclear instrumentation power

level indicators were not consistent with heat balance calculations." In reference to that statement, state:

a. Precisely what that statement refers to;

b. Each and every time previous to and subsequent to the above-mentioned instance in which this inconsistency was manifest;

c. If the problem has been completely rectified, or if it continues to this date to be manifest in any degree, and if it continues, give full details, including degree of continued problem;

d. What the effects of the inconsistency noted above are on the operation of the reactor;

e. The most severe effects of such an inconsistency could be if its magnitude were the most severe physically possible for the reactor;

f. The efforts made to eliminate the problem;

g. Identify in detail each and every document, log or record which might provide documentation of answers to interrogatory no. 26(a-f) or additional details to those questions;

h. State the location of each document identified in answer to interrogatory no. 26(g);

i. State the name, address and phone number of the custodian of each document identified in answer to interrogatory no. 26(g).

j. State whether you will provide the documents listed in your response to No. 26g above without a formal motion to produce.

27. Inspection Report 68-1 continues its discussion of problems related to the "heat balance" by saying, "the maximum speed was ... five percent and detector positioning was made without undue delay." In reference to that statement, state:

a. Precisely what is meant by "maximum speed";

b. If the maximum speed since then has ever been greater than five percent, and if so, detail each instance and how great the maximum speed was;

c. What detector is referred to;

d. What precisely is meant by "detector positioning;"

e. What documents exist regarding the effect of speed and detector positioning on reactor operation, particularly with regard to the heat balance;

f. The location of any documents identified in response to interrogatory no. 27(e);

g. The name, address and phone number of the custodian of each document identified in response to interrogatory no. 27(e).

h. Whether you will provide the documents identified in response to No. 27e without a formal motion to produce.

28. Inspection Report 68-1 states that NEL's DR. SMITH said that "the nuclear instrumentation heat balance power level discrepancies have been a long-term, but not increasing problem." The report continues, "He said that work was continuing to stabilize nuclear channel long-term operation so that the need for detector relocation can be kept to a minimum." In reference to these statements, state:

a. Precisely what was meant by "the nuclear instrumentation-heat balance power level discrepancies;"

b. Precisely how long the discrepancies mentioned had been going on;

c. How long those discrepancies continued after DR. SMITH made that statement to the AEC inspector;

d. If those discrepancies continue to this day;

e. If the discrepancies, at any point, became an "increasing problem;"

f. If the answer to interrogatory no. 28(e) is in the affirmative, at what point and how much of an increasing problem did the discrepancies become;

g. Precisely what was meant by "stabilize nuclear channel long-term operation;"

h. What work was then continuing to stabilize said operation;

i. What the results of that work were;

j. If work continued after the AEC inspection;

k. If the answer to interrogatory no. 28(j) is in the affirmative, state precisely what work, for how long, and what its results were;

l. If the phrase "stablize nuclear channel long-term operation" refers to instabilities occuring when the reactor is run for long intervals;

m. If the answer to interrogatory no. 28(l) is in the affirmative, precisely what instabilities occurred, and what length of operation brought on these instabilities;

n. If the problems with instabilities have been noted since that inspection;

o. If the answer to interrogatory no. 28(n) is in the affirmative, detail each and every instance;

p. If the reactor or its support equipment face any problems when run for long periods;

q. If the answer to interrogatory no. 28(p) is in the affirmative, detail with specificity each problem and each instance and the length of operating period involved;

r. If the answer to interrogatory no. 28(p) is in the affirmative, detail if these problems affect reactivity control mechanisms in any way, particularly the control blades;

24. From the period 1960 through the present, specify any problem that has been noted during long-term operation (by which we mean any period of operation greater

than five hours) related to or due to the graphite used in the reactor including but not limited to:

a. dimensional changes;

b. reactivity changes;

c. thermal or electric conductivity changes;

d. chnges in tensile strength;

e. temperature changes;

f. storage or release of Wigner energy;

30. Whether or not long term operation problems have occurred, have any of the graphite effects referenced in interrogatory 29 been observed during reactor operation?

a. If so, please describe each and every instance.

31. Have control blade insertion or withdrawal times ever been altered during long term operation?

32. Have control blades ever become stuck during long term operation?

a. If so, what was done to free them?

33. Have the control blades become stuck other than during long term operations?

a. If so, please describe each such instance and what was done to unstick the blades.

34. Have NEL personnel manually freed the control blades at any time in response to their sticking during reactor operation?

a. If so, please describe each such instance

b. What written procedures exist for manually freeing the control blades?

35. Have NEL personnel ever "torqued" a control blade down with a pipe wrench?

a. If so, please describe each such instance, including the date, names of personnel involved, and the results of the action taken.

36. Inspection Report 68-1 attributes a statement to Dr. Smith regarding attempting to keep detector relocation to a minimum;

a. What kind of rlocation was contemplated?

b. Did it take place?

c. Does the relocation referenced above refer to some modification of the reactor that would be necessary if neutron channel stabilization during long term operation cannot be achieved?

37. Regarding maintenance of the graphite by annealing it or treating it for the "Wigner disease," state:

a. All procedures and requirements for annealing the graphite;

b. How often the annealing is to be done;

c. When the last time the graphite was annealed;

d. How the graphite is annealed for this reactor.

e. What hazards analysis or safety analysis calculations have been done to determine the frequency necessary for annealing and the means to be used to reduce the likelihood of a Windscale-type accident during annealing?

f. If no annealing has ever been done for the graphite, state why not;

(1) Please identify all documents in which an analysis was performed which determined that no annealing was necessary;

(2) State the dates of all meetings of Radiation Use, Reactor Use, Radiation Hazards, Reactor Hazards, Radiation Safety or Reactor Safety committees in which the decision not to anneal the graphite was made;

(3) Indicate also the number of megawatt days Applicant considered and/or considers necessary to be reached before annealing would be prudent;

38. How much Wigner energy has the graphite absorbed to date (suggested unit: Cal/gram of graphite adjacent to the fuel boxes; also total Calories);

(1) How much Wigner energy in addition to that already absorbed will be absorbed by the graphite if the requested twenty-year license renewal is granted, and reactor operates at maximum licensed level and no annealing is done;

(2) Identify all records of such calculations, all source materials used in making these assessments (including books, articles, advice of experts, etc.);

h. What procedures exist to deal with Windscale-type accident involving Wigner energy release in case such an accident occurs;

(1) What would be used to put out a Windscale-type fire (e.g. water, CO_2, air) and how would it get to the fire area within the core;

(2) What procedures exist for dealing with this specific kind of accident, and what devices are on hand for coping with it;

(3) If water were used to put out the fire, and the control blades were froze in the out position, what would prevent the water from bringing the reactor to critical.

39. Please identify all maintenance and calibration

that must be done at routine intervals that requires reactor operation and that has not been identified in interrogatories 3-29. For each, please identify:

a. The interval at which said maintenance or calibration is to be done;

b. Each and every time when said maintenance or calibration was not done at the suggested interval;

c. The worst possible consequences of major error in or failure to do said maintenance or calibration;

d. How long it takes to do said maintenance or calibration;

e. All documents that detail procedures, requirements, and actual details of said maintenance or calibration.

f. Whether you will provide said documents without a formal motion to p roduce.

30. Please identify all maintenance and calibrations that must be done at routine intervals that do not require reactor operation and that have not been identified in interrogatories 3-30. For each, please identify:

a. The inte al at which said maintenance or calibration is to be done;

b. Each and every time when said maintenance or calibration was not done at the suggested interval;

c. The worst possible consequences of major error

in or failure to do said maintenance or calibration;

d. How long it takes to do said maintenance or calibration;

e. All documents that detail procedures, requirements, and actual details of said maintenance or calibration.

f. Whether you will provide said documents without a formal motion to produce.

41. How many hours of maintenance and calibration requiring reactor operation are minimum to meet the requirements for all instruments in a twelve-month period? In relation thereto, state:

a. The records that document the minimum time necessary;

b. The name, address and telephone number of the custodian of said records;

c. If you will provide said records without a motion to produce.

42. What kinds of records not identified in earlier answers to these interrogatories exist regarding all forms of maintenance and calibration? For each record state:

a. The location of said record;

b. The name, address and telephone number of the custodian of said record;

c. If you will provide said records without a motion to produce.

43. Applicant indicates in Application that only one hour of maintenance and calibration required by the Technical Specifications to be done during reactor operation had been done in 1979. In relation thereto, state:

a. What calibration and maintenance was done in 1979;

b. What required calibration and maintenance was not done in 1979.

44. Has the heat balance calibration ever been delayed or cut short because of problems involving long-term operation of the reactor or any other problem related to the heat balance?

45. If the answer to interrogatory no. 33 is in the negative, detail when, what problems, whether delayed or cut short.

INTERROGATORIES AS TO CONTENTION A

"Environmental Impact Statement Needed"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Does Applicant contend that the information it has supplied to the NRC Staff to date regarding environmental impacts of its reactor is sufficient to support a negative declaration?

4. If the answer to interrogatory 3 above is affirmative, please specify which particular information it is referring to in its answer to 3 above.

5. Please specify all information, data, and facts upon which it based its statement at page II/3-1 of the Application regarding "Environmental Effects of Accidents": "Accidents ranging from failure of experiments to the largest core damage and fission product release considered possible result in doses of only a small fraction of 10 CFR Part 100 guidelines and are considered negligible with respect to the environment."

a. Please specify what Applicant considers negligible with respect to the environment, in radiation dose level.

b. please indicate all calculations and studies done that support that finding or contradict it.

c. Please indicate all documents which Applicant relied on in drawing the above conclusion and whether Applicant will produce said documents absent a formal motion to produce.

INTERROGATORIES AS TO CONTENTION XII

"Inadequate Safety Features"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

   a. Please identify each and every such person.

   b. Please state the number of each interrogatory with respect to which that person was consulted.

   c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Does the NEL reactor have an Emergency Core Cooling System?

a. If either the graphite or the uranium caught fire, as occurred at the Windscale, reactor accident, what safety system exists to cool the fire?

b. If a power excursion occurred at the reactor sufficient to cause melting of cladding or fuel, what safety system exists to cool the melted fuel elements?

c. If NEL has no emergency cooling system, or other safety system to cool the core in emergency situations, why not?

(1) What safety analyses exist showing the lack of need for such systems?

(2) Will Applicant provide such safety analysis without a formal motion to produce?

4. Does NEL contend that the reactor has a containment structure designed to contain fission products and overpressure in case of accident?

a. If so, describe in detail such containment structure.

5. What is the leak rate into the reactor room when negative pressure is maintained?

6. What is the leak rate from the reactor room when negative pressure is not maintained?

7. What is the leak rate from the reactor room at pressures inside the room of over one atmosphere?

8. For interrogatories nos. 5, 6 and 7 above, please indicate whether these values are calculated or measured, and:

a. If calculated, please provide the calculations;

b. If measured, identify any and all records of the measurements, and indicate whether Applicant will provide such records without a formal motion to produce.

9. What actions have been taken to increase the capability of the reactor room and/or the NEL facility generally to contain a fission product release and overpressure?

10. Please describe the location, type, and purpose of any and all airlocks at NEL.

11. Please identify all safety analyses that have been conducted dealing with the adequacy of the NEL containment/housing system. Will you provide said analyses without a formal motion to produce?

12. Does the reactor have a boron-injection system or other system for the ready insertion of neutron absorbing materials into the reactor core besides control blades in case of emergency requiring such insertion?

a. If yes, please describe the system and identify all documents related to it;

b. If no, please indicate why no system exists and all safety analyses or hazards analyses prepared that determined no such system was needed;

(1) Please indicate when such analyses were last reviewed by NEL review committees;

(2) Will you provide said analyses without a formal motion to produce.

c. Is boron or some other similar neutron absorbing material available at NEL in case it is needed?

(1) If so, where and how is it stored.

(2) How would this material be used if it was needed?

(3) Are these procedures contained in any document?

(4) Will Applicant provide such documents without a formal motion to produce?

13. Specifically state what systems NEL has for the removal of radioactivity from gaseous and liquid effluent streams during normal operations.

a. Does NEL have HEPA filters? If so, describe their placement and effeciency.

b. Does NEL have other radioactivity filters? If so, describe their placement and effeciency.

c. Does NEL have holdup/decay/delay tanks in use at present for gaseous emissions?

(1) If so, give details of radioactivity reduction factors measured, and a capacity of system;

(2) If no such system is now in use, why not?

d. Does NEL have holdup/delay/decay tanks in use for liquid effluents?

(1) if yes, for how long is the liquid effluent delayed before release to the environment and what is the estimated radioactivity reduction during that delay;

(2) Is the purpose of such delay radioactive decay or merely for monitoring purposes before release;

(3) For liquid effluents are delays from primary coolant, secondary coolant, or both?

e. If primary coolant is in a sealed loop, how is primary coolant eventually disposed of;

f. Please describe the sensitivity, threshhold, model, make, location, of liquid effluent monitoring devices.

g. Please indicate all isotopes tested for before either primary or seconday coolant is disposed of (in

particular, whether Strontium-90, Cesium-137, Iodine-131, or Plutonium, Radium, Thorium, Radon, are monitored for, and the sensitivity of detection for each isotope) and at what levels alarms or trips are set for;

h. Besides those features listed in interrogatory 13(a)(b) (c) or (d), what other radioactivity removal systems does NEL have?

i. Have either the primary or secondary coolant systems experienced leaks? If so, please describe when and how these leaks occurred.

14. What emergency liquid and gaseous emissions holding tanks does NEL have?

15. Does NEL have spare motors for its control blades? If so, state:

a. How many;

b. How old are they;

c. When they were last tested;

d. Where they are kept;

e. How long it would take to replace the existing motors with the spare motors?

f. If Applicant does not have spare motors, why not?

16. Identify the location, thickness and composition

of all shielding on each side and the top of the reactor structure itself.

a. If figures are available, give shielding effectiveness factors for neutrons and gamma irradiation and specify how these factors were estimated or measured.

17. Identify all weak points in the shielding of the reactor itself.

18. Where are the highest radiation fields at various locations around the reactor structure?

19. Identify high radiation areas.

20. Do neutrons or gamma irradiation stream through openings in shield plugs, control blade apertures, irradiation ports, water level sight hole, or any other aperture in the reactor structure?

21. Give all radiation readings at 100 kw, 1963 through present, for all locations for which measurements have been taken around and on top of the reactor structure, both for neutrons and gamma. If these readings are in documents, identify said documents and indicate whether you will produce without a formal motion to produce.

22. Identify the location, thickness and composition

of all radiation shielding built into the four walls of the reactor room and its roof (the ceiling/floor separating the second and third floors).

a. Specifically, what degree of shielding for neutrons and gamma radiation are provided by the reactor room roof?

b. How was the answer to Interrogatory 22a calculated?

c. Please identify any and all documents and data which support the answers to Interrogatories 22a and 22b and whether you will produce absent a formal motion to produce.

23. a. Why is the third floor equipment room above the reactor room fenced and locked?

b. Is it locked for radiation protection?

c. If answer to 23b is affirmative, identify the source(s) of radiation.

24. Is the third floor lunch area above Tokamak also fenced and locked for radiation protection?

25. If the third floor equipment room and lunch area are restricted for radiation protection purposes, why is the walkway between them unrestricted?

26. Please provide all radiation measurements taken

from 1960 to the present in the following areas (note: these answers shall include all film badges, TLDs, GM surveys, and all other devices capable of measuring gamma and/or neutron):

a. Third floor void area containing equipment room;

b. Walkways on all three sides;

c. Snack bar/cafeteria on third floor next to equipment room;

d. Rooms on fourth, fifth and sixth floors above reactor;

e. The four sides of the reactor room, outside the reactor room;

f. The nearest public areas on four sides of the NEL area.

27. For all your answers to interrogatory no. 26, please indicate whether the device measured gamma, beta, and/or neutrons, and the threshhold and sensitivity of the device, and the probability of error. Please in addition to giving average readings, provide <u>all</u> individual readings, and identify highest readings recorded.

a. Indicate also whether reactor was on at time of measurement and at what power level.

28. If no radiation measurements have been routinely

taken in any of the areas listed in interrogatory no. 26(a-f), please indicate why not.

29. Why is the wall separating the reactor stack area from the unrestricted area on the top of Boelter Hall no more than four feet high?

a. Why is there no barbed wire atop it?

b. Why is there an open doorway in the windscreen around the reactor stack, with no door in that doorway?

c. Why is there no top to the windscreen?

30. Identify in detail each interlock, inhibit, and scram system currently in use at the NEL reactor, including:

a. At the location of the interlock, inhibit or scram system itself and its controls,

b. The purpose of said interlock, inhibit, or scram system,

c. Whether such interlock, inhibit or scram system can be overridden;

d. If so, how;

e. If so, has it ever been overridden;

f. If so, indicate each occasion and the reason.

31. Is there an interlock or inhibit system designed to prevent operation of the reactor while someone is in the reactor room?

a. If so, please indicate how it works;

b. Whether it can be overridden;

c. If it can be overridden, whether it ever has and whether it has ever failed?

d. Has the reactor ever been run with someone inside reactor room?

(1) If yes, give details and date(s) at each such occurrence.

32. Is there an interlock or inhibit system designed to prevent operation of the reactor while someone is in the third floor void area encompassing the equipment room?

a. If so, please indicate how it works;

b. Whether it can be overridden;

c. If it can be overridden, whether it ever has been;

d. Has it ever failed;

e. Has the reactor ever been run while someone was inside that area?);

(1) If yes, specify dates and details of each such occurrence, including how interlock or inhibit failed or was overridden, including names and addresses of all individuals involved in such occurrences.

33. Is there an inhibit or interlock system that can prevent insertion of a sample of large worth into pneumatic

tube and/or irradiation ports?

a. Or that can prevent operation of reactor with such a sample?

b. Or prevent removal of said sample without first reinserting control blades?

34. If the answer to interrogatory 33(a) or (b) is in the affirmative, describe the interlock or inhibit system:

a. Whether it can be overridden;

b. Whether it has ever been overridden, and if so, give details, including dates and reasons;

c. How it can be overridden?

d. Whether it has ever failed, and if so, give details, including dates and causes.

35. List all missile shields for the reactor and its components and controls.

36. In particular, are there missile shields protecting control blade components?

37. If there are no missile shields, please indicate all Hazards Analyses or safety analyses done that indicated none were needed, and when such analyses were last reviewed by appropriate reactor supervisorial committees.

38. Please describe the tie bolt failure problem that

existed at the reactor in the 1960's.

a. Have any similar failures occurred since 1970;

(1) If so, please describe.

39. Application p. III/6-2 indicates that A.I. made the fuel, then in parenthesis says (2nd time). What happened to the fuel the first time?

a. Was there something wrong with the first fuel?

b. Were there any fuel failures? Please detail.

40. Specialized (Annual Activity) report for 1976 indicates on p. 35 that "damaged but 'hot' fuel plates" were used for an experiment on production of amino acids under primitive earth conditions.

a. Please explain in detail how those fuel plates became damaged;

b. When the damage occurred;

c. Any and all other instances in which fuel plates were damaged.

41. Have dimensional changes occurred in the graphite used in the reactor? If the answer is yes, please answer the following:

a. Did these changes involve swelling, contracting, or both? Be specific.

b. What is the maximum swelling and/or

contracting that has occurred? Please answer both in percentage and in inches or centimeters.

c. Where did the swelling and/or contracting occur --in precisely what parts of the graphite, in what locations in the reactor?

d. Have these dimensional changes become more noticeable over the years? If so, please explain.

e. Do these dimensional changes occur or increase when the reactor is run for long periods (i.e. over 5 hours)?

f. Were there greater dimensional changes when the reactor was run at 500 kw_{th} than at 100? Similarly for 100 kw_{th} rather than at 10?

42. Has cracking or rupturing of the graphite ever been observed? If yes, please indicate precisely when, the location of the graphite, what was done about the cracking or rupturing, and what the cause was determined to be.

43. Has the graphite ever absorbed enough steam and/or water to affect the reactivity of the reactor measurably? If yes, please indicate precisely:

a. When this occurred;

b. The conditions which led up to and caused it;

c. The degree of reactivity change;

d. The measures taken to prevent repeated

occurrences.

44. Have control blade problems (reduced insertion time, sticking, pinning, inability to withdraw or insert automatically) ever been associated with or thought to be associated with dimensional changes, cracking, rupturing, or soaking of the graphite? If yes, please give details of each and every instance of control blade problems, date of said problems, exact nature of problem, relationship thought to exist with graphite, evidence of connection with graphite.

45. Have there ever been problems doing the heat balance calibration associated with long-term operation of the reactor? If yes, please answer the following:

a. Have any of those problems involved difficulties inserting or withdrawing the control blades?

b. If yes to a above, please describe specifically the control blade problems.

c. If yes to a above, please describe specifically any relationship thought to exist between the control blade problem, the heat balance calibration, and/or the graphite.

d. Specifically, does the heat balance calibration ever lead to dimensional changes in the graphite that make control blade operation impaired? If yes,

precisely when did this occur, and what precisely was the nature of the problem.

46. Has Applicant ever been informed of problems other reactors have had with graphite moderators and/or reflectors, such as dimensional changes, cracking or rupturing, soaking, or reactivity coefficients, or Wigner energy? If yes, please identify which other reactors, specifically which problems were identified, how Applicant was notified, and what records exist of that notification.

47. What knowledge does Applicant have in its possession that indicates that the graphite used in its reactor poses no hazard due to dimensional changes, positive reactivity coefficients, soaking, cracking, rupturing, or Wigner energy absorption/release? Be specific.

48. What evidence, documents, records, studies, reports, calculations, or other written material does Applicant have or know of that would indicate no hazard from the graphite conditions mentioned in response to Interrogatory 47 above? Will Applicant provide those materials without a formal motion to produce?

49. What knowledge does Applicant have in its possession that indicates that the graphite used in its

reactor could poses some hazard, from a minor potential hazard to a major actual hazard, due to the conditions mentioned in response to Interrogatory 47 above.

50. What evidence, documents, records, studies, reports, calculations, or other written material does Applicant have or know of that would indicate a hazard, from a minor potential hazard to a major actual hazard, from the graphite conditions mentioned above in response to Interrogatory 47? Will Applicant provide without a motion to produce?

51. What knowledge does Applicant have of other potential safety matters related to graphite used in their reactor? Be specific.

52. What evidence, documents, records, studies, reports, calculations, or other written material does Applicant have or know of that could document or give additional detail to Applicant's response to Interrogatory 51 above?

53. Have there ever been fuel failures or fuel damage at the NEL reactor? Please provide the following details if the answer is yes:

a. When did the fuel failure or damage occur?

b. Were any fission products released?

c. If the answer to be is yes, precisely how much and which fission products, detected by which specific instruments, with what sensitivity, threshhold, accuracy, and ability to measure for which isotopes?

d. How many fuel plates failed or suffered damaged in each case?

e. What was the extent of damage or failure in each case?

f. What was determined to be the cause of the damage or failure in each case.

g. What records exist that document any of the answers to the above subparts of question 53, and will Applicant produce those records without a motion to produce?

54. Have any other Argonaut-type reactors suffered any fuel failures or fuel damage of which Applicant is aware? If yes

a. Specifically what failure or damage occurred;

b. At which facilities;

c. When?

d. What was the cause and extent of the failure or damage?

e. What records does Applicant possess or knows exist that provide additional information or document answers to 54a through d, and will Applicant provide those

records it possesses without a formal motion to produce?

55. Please describe what information Applicant has about failures or damage undergone by MTR type fuel in facilities besides Argonaut-type reactors including:

a. The date, location of each such incident;

b. The extent and cause of damage;

c. What records are in Applicant's possession that document said damage or failures and whether Applicant will provide without a motion to produce?

d. What records are not in Applicant's possession but which Applicant has knowledge as to their existence and possible source for acquisition.

e. What efforts have been made by Applicant to review MTR fuel experience?

f. Will Applicant produce said records without a motion to produce?

56. a. What is the precise lowest melting temperature of the aluminum cladding used in Applicant's fuel?

b. What is the precise lowest melting temperature of the uranium-aluminum alloy used in Applicant's fuel?

c. What is the lowest burning temperature of the uranium used in Applicant's fuel?

d. What is the lowest burning temperature of the graphite used in Applicant's reactor?

e. What is the lowest temperature at which an exothermic reaction between coolant water and aluminum cladding can take place in the Applicant's reactor if the temperature is rapidly attained?

f. What error bars, if any, does Applicant contend should be given to the figures provided in 56a through e?

g. What records and other written material does Applicant have that document the answer for 56a through f, and will Applicant provide them without a motion to produce?

INTERROGATORIES AS TO CONTENTION XIII

"Special Nuclear Material License Opposed:
Bomb Grade Enrichment-Excessive Quantity"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

(a) Please identify each and every such person.

(b) Please state the number of each interrogatory with respect to which that person was consulted.

(c) Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Precisely on what pages of the Application does Applicant provide the information required by 10 CFR 70.22(a)(7) and (a) (8) and 70.24(a)(1), (2), and (3)?

4. What specific means are employed by Applicant for monitoring for accidental criticality of the fresh fuel?

5. What specific means are employed by Applicant for monitoring for accidental criticality of irradiated fuel?

6. What specific procedures are employed by Applicant to avoid accidental criticality?

7. What documents are in Applicant's possession that provide information relative to the answers for interrogatories 4-7? Will Applicant produce said documents absent a formal motion to produce?

8. The original Argonaut reactor utilized 20% enriched fuel.

a) What problems does Applicant know of that the original Argonaut reactor faced with 20% fuel?

b) The University of Florida originally utilized 20% enriched fuel. What problems does Applicant have knowledge of regarding their experience with that enrichment fuel?

c) What problems would UCLA face if required to utilize 20% enriched fuel?

d) What facts are in Applicant's possession that support or contradict

answers to questions 8a through c?

e) What documents are in Applicant's possession that provide the basis for answers 8a through d? Will Applicant produce said documents absent a formal motion to produce?

9. Application indicates that original UCLA fuel loading was 3445.2 grams U-235 and that current loading is 3556 gms.

a. Why does Applicant contend it is essential that it be able to have 4700 gms irradiated fuel when the core can only contain under present loading 3556 gms?

b. Why does Applicant request licensed limit of 4700 gms U-235 in fresh fuel when only 3556 can be loaded under current loading even if all the fuel needed replacing simultaneously?

c. Why does Applicant request licensed limit of 4700 gms irradiated and 4700 gms unirradiated? Cannot the reactor function with only irradiated fuel on site (when the fuel is in the core) or only unirradiated fuel on site (when spent fuel has been removed and fresh fuel is to be added) or some lesser combination of both?

d. What facts are in Applicant's possession which support or contradict its answers to 9 a through c?

e. What documents are in Applicant's possession that either support or contradict its answers to 9 a through b? Will Applicant produce said documents absent a formal motion to produce?

10. Would Applicant be unable to have the reactor function if it were permitted to have on site at any one time only 3600 gms fresh fuel or 3600 gms irradiated, or any combination of fresh and irradiated so that the combination of U-235 totally present at any one time could be no more

than 3600 grams?

a. Present all facts in Applicant's possession that support or contradict the answer above.

b. Please indicate all documents in Applicant's possession that support or contradict the answer above. Will Applicant produce said documents absent a formal motion to produce?

11. Would Applicant be unable to have the reactor function should the enrichment level of its fuel be reduced from 93% to 20%?

a. Please present all facts in Applicant's possession that support or contradict the answer to 11 above.

b. Please indicate all documents in Applicant's possession that support or contradict the answer to 11 above. Will Applicant produce said documents absent a formal motion to produce?

12. If the answer to 11 above is that the Applicant could not function the reactor on 20% enriched fuel, please specify precisely what is the minimum level of enrichment with which the reactor could function.

a. Present all facts which support your answer; please indicate all documents which support the answer; and whether you will produce said documents absent a formal motion to produce.

13. If the answer to 10 above is that Applicant could not operate the reactor were such a limitation imposed, please indicate the minimum quantity of fuel, irradiated and non-irradiated, or any combination thereof, with which the reactor could operate.

a. Present all facts which support your answer; please indicate all documents which support the answer; and whether you will produce said documents absent a formal motion to produce?

14. What is the minimum amount of U-235 necessary at 93% enrichment to make an atomic bomb?

a. What percentage of that amount would the proposed licensed limit for this facility constitute?

b. what documents form the basis for Applicant's answers?

c. will Applicant produce said documents absent a formal motion to produce?

INTERROGATORIES AS TO CONTENTION XIV

"Failure to Analyze Problems Common to Similar Reactors"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories. If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Please indicate the location and date on which it went critical of all Argonaut-type reactors ever built.

4. Please indicate which of the above Argonaut-type reactors are still functioning.

5. Please indicate all Argonaut-type reactors built by AMF.

6. Please indicate all Argonaut-type reactors built by American Radiator and Standard Sanitary Corporation.

7. Please indicate all other manufacturers of Argonaut-type reactors and which specific reactors they built.

8. Please indicate all efforts made by Applicant, 1958 through the present, to learn from the operating experience of these other Argonaut-type reactors.

a. Please indicate all documents in Applicant's possession related to those efforts.

b. Will Applicant produce said documents absent a formal motion to produce?

9. Is American Radiation and Standard Sanitary Corporation still in the business of making or servicing Argonaut-type reactors?

10. Is any other company still in the business or making or servicing Argonaut-type reactors?

11. The original Argonaut reactor ran at .5% excess reactivity. Why does the UCLA reactor have a licensed limit of 2.3%--what does Applicant contend is essential to be done that cannot be done at .5%?

12.. . Who manufactures the fuel for the UCLA reactor? Who manufactures the fuel for the other Argonaut-type reactors?

a. What has been the operating experience of that kind of fuel?

b. Have any reactors using it suffered fuel damage or failures?

c. If the answer to b is affirmative, please give details and what efforts have been made by Applicant to avoid the same problems at its facility.

13. What studies is Applicant aware of regarding problems or characteristics common to Argonaut-type reactors?

a. Will Applicant produce said studies absent a formal motion to produce?

14. a. What studies have employees of Applicant participated in regarding problems or characteristics common to Argonaut-type or small research reactors? b. Have any UC employees, including but not limited to employees at Lawrence Livermore, Lawrence Berkeley, and Los Alamos, participated in such studies? c. Please specify all studies identified in 14 a and all UC employees by name and location who have participated in such studies. d. What documents exist in Applicant's possession which relate to said studies? e. Will Applicant produce said documents absent a formal motion to produce?

15. What levels of excess reactivity limits are found at each other existing Argonaut-type reactor in the country?

16. Will Applicant produce documents #2, 5, 6, and 7 listed on page III/10-1 of the Application absent a formal motion to produce?

17. Please detail all meetings that have taken place between staffpeople of Argonaut-type reactors and the UCLA reactor to share experience and pool information, including date of such meeting and what records exist of such meetings.

18. What Hazards Analyses for other Argonaut-type reactors are in Applicant's possession? Will Applicant produce them absent a formal motion to produce?

19. What reports has Applicant received or have in its possession regarding an alleged problem at the University of Florida reactor regarding secondary water level and pressure loss due to being tied into the regular plumbing system for the school? Will Applicant produce said documents absent a formal motion to produce?

a. Has Applicant ever experienced any similar problems?

b. If so, please detail each such instance.

20. An AEC inspection report for the UCLA reactor in the late 1960s report a notification of UCLA via an AEC inspector of a positive temperature coefficient being observed at the University of Washington reactor.

a. Had Applicant previously observed a positive tempoerature coefficient for the graphite?

b. If so, what was the earliest date at which Applicant was aware of a positive temperature coefficient for the graphite?

c. What subsequent testing did Applicant do to determine the exact degree and nature of said coefficient?

d. What documents are in Applicant's possession regarding all such testing and all information regarding temperature coefficients for the

graphite? Will Applicant produce said documents absent a formal motion to produce?

e. Whenever Applicant first noted the positive coefficient, did it notify other Argonaut-type reactors? If so, please indicate all records of such notification and whether you will produce them absent a formal motion to produce. If not, why not?

21. One Commission inspection report noted that another Argonaut type reactor had problems with the lack of spare control blade motors and indicated that at the time UCLA also had no backup motors. Does Applicant now have such spare motors?

22. Indicate all problems experienced at other Argonaut-type reactors of which Applicant is aware, the manner in which Applicant became aware, whether similar problems have existed at UCLA's reactor, what documents exist regarding such problems, and whether Applicant will produce those documents absent a formal motion to produce.

23. Indicate all problems experienced at the UCLA reactor that UCLA has notified other Argonaut-type facilities about, what documents exist regarding such notification, and whether Applicant will produce said documents absent a formal motion to produce.

24. Indicate all efforts UCLA has made to discover problems at other Argonaut-type reactors that might indicate problems at the UCLA facility. If those efforts have been limited, please indicate why.

25. Please indicate the three worst problems or accidents at each of the other Argonaut-type reactors and what analysis has been done to determine whether the UCLA facility is susceptible to a similar problem or accident.

INTERROGATORIES AS TO CONTENTION XV

"Densely Populated Site"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

I. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Was an initial environmental impact report produced for the reactor building?

a. If so, does the university possess this report?

b. If not, who is in possession of the report?

c. Will the university produce this report without a formal motion to produce?

4. Were any subsequent environmental impact reports produced in conjunction with new constructions or modification of Boelter Hall or the Math Sciences building?

a. Does the university possess these reports?

b. If not, who is in possession of these reports?

c. Will the university produce these reports without a formal motion to produce?

5. Does the university possess an original "as built"site plan for the reactor building?

a. If not, who is in possession of the plan?

b. Will the university produce this plan without a formal motion to produce?

6. What was the most recent construction or modification in the immediate vicinity of the reactor building?

a. Does the university posess an original "as built" site plan for this most recent construction or modification?

b. If not, who is in possession of this plan?

c. Will the university produce this plan without a formal motion to produce?

7. Does the university possess original "as built" architectural plans for Boelter Hall and the Math Sciences building?

a. If not, who is in possession of these plans?

b. Will the university produce these plans without a formal motion to produce?

8. Does the university possess architectural plans for all alter-

ations in Boelter Hall and the Math Sciences building?

a. If not, who is in possession of these plans?

b. Will the university produce these plans without a formal motion to produce?

9. Does the university possess original "as built" air conditioning plans for Boelter Hall and the Math Sciences building?

a. If not, who is in possession of these plans?

b. Will the university produce these plans without a formal motion to produce?

10. Does the university possess "as built" air conditioning plans for all alterations in Bolter Hall and the Math Sciences building?

a. If not, who is in possession of these plans?

b. Will the university produce these plans without a formal motion to produce?

11. Does the university possess the original daily occupancy report for the reactor building?

a. If not, who is in possession of this report?

b. Will the university produce this report without a formal motion to produce?

12. Does the university possess daily occupancy reports for Boelter Hall and the Math Sciences Building for the years 1976 through 1980?

a. If not, who is in possession of these reports?

b. Will the university produce these reports without an official motion to produce?

13. Does the university possess projected daily occupancy reports for Boelter Hall and the Math Sciencds building for the next twenty years?

a. If not, who is in possession of these reports?

b. Will the university produce these reports without a formal motion to produce?

14. Does the university possess a copy of the design criteria for the reactor building?

a. If not, who is in possession of the design criteria?

b. Will the university produce the design criteria without a formal motion to produce?

15. For which of the following does the university possess figures for daily occupancy?

a. "The Treehouse" in Ackerman Union.

b. The Student Store in Ackerman Union.

c. The coffee house in Kerkhoff Hall.

d. The printing and duplicating facility in Kerkhoff Hall.

e. The "Bombshelter" in Life Sciences quad.

f. The Snack bar in Boelter Hall.

g. Will Applicant produce above figures without a formal motion to produce?

16. How did the university derive the population figures used in Section 3.6 of part III of the application?

17. What is the total current population of UCLA, including students, faculty and staff?

18. Roughly how many visitors visit UCLA:

a. Each day?

b. Each year?

19. For which of locations 15athrough d does the university possess daily sales figures?

INTERROGATORIES AS TO CONTENTION XVI

"Too Old"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

I. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Precisely to which specific instruments and items of equipment did Dr. Catton refer when he wrote in his Annual (Specialized Activity) Report for 1976, p. 35L "Some of the reactor instrumentation is still workable, but sometimes unreliable, and is very difficult to repair due to its age and the resultant problem of obtaining parts (e.g., vacuum tubes, specialized switches, indicators, and meters)." Please identify each and

every piece of reactor instrumentation to which Professor Catton was referring, and specifically what difficulty in repairing, obtaining spare parts, or reliability was the problem.

4. Please identify each and every item of reactor instrumentation not identified in Interrogatory 3. above that has :

a. Had reliability problems.

b. Has proven difficult to repair due to its age.

c. Has experienced problems of obtaining parts.

5. Professor Catton also wrote in the above-mentioned report: "If the NEL receives extra funds, the orderly updating of console instrumentation will proceed."

a. Did NEL receive the extra funds?

b. Did NEL receive all of the extra funds requested?

c. What was the size of the specific fund request and what was the size of the specific appropriation of "extra funds?"

d. Which particular console instrumentation was to be updated?

e. Which particular console instrumentation was updated?

f. Which particular console instrumentation updating had to be postponed?

g. What documents exist that relate to proposed updating, budget requests, appropriations granted or turned down, actual instrument updating, and will Applicant provide without a formal motion to produce?

6. Were the Applicant to receive a grant for one million dollars, earmarked entirely for instrument updating, safety device addition, and

general improvements of the reactor, please list ten or twenty changes or additions to the reactor and its instrumentation and equipment that would be made, with the highest priority at the top and the lowest at the bottom. Please have Dr. Catton, Neill Ostrander, Charles Ashbaugh, and Jack Hornor each provide their own list of improvements.

7. Page 36 of the Annual (Specialized Activity) Report stated: "If money is found, our antiquated activation analysis laboratory must be modernized. It is currently about 10 years behind the state of the art."

a. Was money found?

b. Was it modernized?

c. What needed modernization?

d. What was modernized?

e. What modernization still needs to be done.

f. How much money for modernization is still needed?

8. Which specific forms of maintenance have had to increase because of the age of the reactor or its components?

9. Which specific devices and classes of devices have required replacement for reasons Applicant associated with age?

10. Which major pieces of reactor or console equipment does Applicant not have original plans for?

INTERROGATORIES AS TO CONTENTION XVII

"Seismic"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Page 10 of the NEL 1966-1967 Annual (Specialized Activity) Report indicates "A U.S. Coast and Geodetic Survey strong motion seismograph is presently housed in Engineering Unit I at UCLA. Early in 1968 the strong motion seismograph will be moved to the Nuclear Energy Laboratory and the

reactor will be instrumented."

a. How long prior to 1968 was the strong motion seismograph housed in Engineering Unit I at UCLA?

b. Was it indeed moved to NEL in 1968?

c. If the answer to 3b is negative, was it moved to NEL at some other time?

d. If the answer to 3c is affirmative, when was it moved?

e. Is the strong motion seismograph still in place at NEL?

f. If not, where is it located?

g. In what form(s) do data from that seismograph exist?

h. Does Applicant have any records of data from that seismograph?

i. If the answer to h is affirmative, specify all such records Applicant has in its possession, including the period of time covered by said records, and whether Applicant will produce said records absent a formal motion to produce?

j. What other records of data from that seismograph exist or may exist but are or may be in the possession of others than Applicant, and in whose possession are those records (including institution, name of custodian of records, address, and phone number.)?

k. What is meant by the statement quoted in 3 above that "the reactor will be instrumented."? Precisely what kinds of instruments were to be associated with the reactor, and precisely where were they to be placed?

4. What other seismographs or other seismic instruments exist on the UCLA campus? Please specify the type of instrument, its precise location on the campus, the nature and period of time of records of data from said instrument, the custodian of said records, and whether Applicant

will produce said records absent a formal motion to produce.

5. Besides those instruments identified in response to interrogatories 4 and 3, specify all instruments which might provide data or other indications of the response of the NEL reactor and/or Boelter Hall to seismic activity.

a. Please indicate the nature of the instrument, its precise location, the period of time it has or had been in place, the nature of the data produced and the form in which it is or was recorded, the custodian of such records, and whether Applicant will produce said records absent a formal motion to produce.

6. Page 10 of the 1966-1967 Annual (Specialized Activity) Report indicates that Professor Matthiessen "is conducting a two-year vibration study of the reactor building and its associated laboratory. These experiments have been conducted while part of the building has been under construction and provide detailed information about the building response."

a. What were the results of the two-year vibration study?

b. Were any seismic vulnerabilities of the building or the reactor indicated or suggested during the study?

c. If so, precisely what vulnerabilities were indicated or suggested?

d. If no vulnerabilities were suggested or indicated during the study, does Applicant contend the study was comprehensive and exhaustive enough to support a conclusion of no seismic vulnerability?

e. What published reports, papers, articles, or books resulted from the study? Please specify date of publication & journal or publisher.

f. What unpublished reports, papers, articles, or manuscripts resulted from the study? Will Applicant produce said materials absent a formal motion to produce?

g. What data was generated in the course of the study, in what form is that data, who is its custodian, and will Applicant produce records of said data absent a formal motion to produce?

7. Page 9 of the 1966-67 Annual (Specialized Activity) Report refers to "vibration tests of reactor structures" and concludes: "Despite core accelerations reaching 0.1 G, the reactor operated without any anomalous behavior."

a. What is the maximum core acceleration possible (in the N-S, E-W, and vertical directions) from a maximum earthquake affecting the reactor?

b. If the maximum core accelerations possible are greater than 0.1 G, what relevance does Applicant contend the vibration tests have for indicating reactor response during a maximum earthquake?

c. Did the scram mechanism shut the reactor down at any point during the vibration tests?

d. If not, at what level of core acceleration would the reactor scram automatically?

e. How was the answer to 7d determined? Please provide all calculations, and indicate all studies, reports, and other documents that support the answer to 7d and indicate whether Applicant will produce said documents absent a formal motion to produce.

f. Has the scram mechanism that is to shut the reactor down automatically in case of earthquake ever been tested? If so, please give dates of said tests, results of said tests, and indicate all documents related to said tests and whether Applicant will produce said documents absent a formal motion to produce.

8. Page III/3-2 of Application states, "The Uniform Building Code, representing the accumulated wisdom of the engineering profession in this field, takes specific account of the earthquake hazard. Virtually none of the structures built according to the specifications of this Code have suffered any damage from earthquakes."

a. Do these two sentences appear verbatim in the UCLA 1960 Hazards Analysis on page 9?

b. If the answer to 8a is affirmative, what specific efforts were made by Applicant to determine that the accuracy of that statement had not been altered in the twenty years since it had been written?

c. When was the Uniform Building Code, according to which the UCLA reactor building was built, written?

d. Has it been revised since? If so, please indicate the date of the revisions.

e. Does the Uniform Building Code that was in effect at the time of the construction of the UCLA reactor and the reactor building take specific account of building code provisions for reactors and reactor buildings? If so, please specify the sections of the Code that so apply.

f. According to applicable regulations today, could a nuclear reactor building be built today according to the Uniform Building Code provisions in effect when the UCLA reactor was built?

g. If the answer to 8f is affirmative, please cite the various regulation sections which support that answer.

h. If the answer to 8f is negative, please cite the various regulation sections which support that answer.

i. Did Applicant assess the experience of Code-complying structures during the Imperial Valley earthquake of October 15, 1979, prior to making the above-quoted statement in its Application for license renewal?

j. Did Applicant assess the experience of Code-complying structures during the Imperial Valley earthquake of October 15, 1979, prior to making the above-quoted statement in its Application for license renewal?

k. If the answer to i or j is affirmative, please indicate how that assessment was made and what its results were.

l. If the answer to i or j is negative, please indicate on what basis Applicant determined the 1960 statement to still be applicable in 1980, absent a review of such recent earthquake experience.

m. Please indicate all UCLA geologists, geophysicists, earth scientists, structural engineers, or other specialists in seismic strength of structures who were consulted prior to making the above-quoted statement in 1980 and the nature of the information they provided.

n. Please indicate all non-UCLA geologists, geophysicists, earth scientists, structural engineers, or other specialists in seismic strength of structures who were consulted prior to making the above-quoted statement in 1980 and the nature of the information they provided.

o. Please indicate all geologists, geophysicists, earth scientists, structural engineers, or other specialists in seismic strength of structures who have been consulted subsequent to the above-quoted statement being submitted in the Application and the nature of the information they provided.

9. Page 9 of the 1966-67 Annual (Specialized Activity) Report refers to "vibration tests of reactor structures" and concludes: "Despite core accelerations reaching 0.1 G, the reactor operated without any anomalous behavior."

a. a Master's thesis prepared by Richard Lee Rudman entitled "Simulation of Earthquake-Induced Vibrations in a UCLA Reactor Fuel Bundle" dated 1968 refers to the October, 1966, vibration tests and

states: "there were no scrams and power operation could be controlled manually or by the automatic controller despite the vibrations and peak accelerations in the core area of 0.01g". Which is the correct figure for peak core accelerations--0.01 G or 0.1 G? (Rudman quote from p. 1 of thesis.)

b. Please indicate the cause of the discrepancy.

10. The master's thesis by Rudman referred to in interrogatory 9a states: "Vitti has shown that increasing the space between adjacent fuel plates results in a positive reactivity change. The moderator gap between adjoining fuel plates is approximately one-half of the optimum moderating distance. The present plate spacing is a nominal 0.137 in. while the spacing required for optimum neutron thermalization was experimentally determined by Vitti to be 0.290 in." (p. 3)

a. "Since the reactor lattice spacing is optimized for minimum crititical mass, any structural rearrangements which might result from a severe earth shock would reduce reactivity." (Application, page III/3-2). Please explain the apparent contradiction between the Rudman statement and that from the Application.

b. If there is a contradiction, which statement is correct?

c. On what basis does Applicant make its answer to 10b?

d. Rudman indicates in his thesis that on one run of the 1966 vibration tests a power oscillation was detected. His thesis concluded that seismically-induced vibrations could cause positive reactivity effects and power changes, but that at the rate of core accelerations being studied the effects from that alone would not be catastrophic. How does Applicant respond to Rudman's conclusions of possible positive reactivity effects which contrast with Applicant's statement quoted in 10a above that any severe seismic effect would reduce reactivity?

11. Page III/3-1 of the Application states: "The nearest major fault is the Inglewood fault running in a north-westerly direction about two miles east of the campus."

a. Smith and Matthiesen's "Vibration Testing and Earthquake Response of Nuclear Reactors" at page 16 indicates that the Inglewood fault is "considered responsible for the 1933 Long Beach earthquake." Does Applicant take issue with this statement by Smith and Matthiesen?

b. If the answer to 11a is negative, why was this information not included in the Application when discussing area seismology and the Inglewood fault in particular?

c. Has Applicant assessed the ground motion, building accelerations, degree of destruction, and other relevant seismic information from the 1933 Long Beach earthquake as these relate to the maximum earthquake possible along the Inglewood fault and the possible effects of such a maximum earthquake upon the reactor structure and upon Boelter Hall?

d. If the answer to 11c is affirmative, please indicate the results of that assessment and describe all documents in Applicant's possession which provide information useful in that assessment and whether Applicant will produce said documents absent a formal motion to produce?

12. In the third floor equipment room, is there a demineralized water system or part thereof? if yes,

a. describe precisely the system or the part thereof

b. whether a tank of water is there and if so, the size of the tank and volume of water contained therein

13. On the eight floor in the area inside the windscreen wherein is contained the reactor exhaust stack, is there an airconditioning apparatus? If so,

a. describe precisely the system

b. if water is present in that system, what is the volume of water therein?

14. Regarding the roof of the reactor room (the floor of the 3rd floor equipment room):

a. what is the thickness of the roof?

b. what is its composition?

c. does it contain steel reinforcement?

d. if so, what is the thickness of the reinforcing rods, to what are they anchored and in what fashion are they so anchored, how many rods are there in the roof, what distance apart are they, and do they all run parallel to each other or do they cross over each other?

e. what is the area in square feet of the reactor room roof?

f. what is the area in square feet of the 3rd floor equipment room?

g. what is the strength of the roof in pounds per square foot?

h. what is the capability of the roof of bending upon impact before fracturing (in inches of bending before fracturing)?

i. what is the stopping velocity of the reactor roof?

j. if the columns supporting the floors of Boelter over the 3rd floor void area were to give way and those above-3rd floor parts of the building were to fall on to the reactor roof, what velocity would the falling building attain and would the reactor roof be able to sustain that impact without fracturing?

k. were the roof unable to sustain such an impact and were it to fracture, bringing the roof and the several floors of upper building with it onto the reactor itself, what impact force would the falling materials have upon the reactor, and would it be able to withstand that force without damage to the core?

l. what is the stopping velocity of the reactor itself?

m. what is the strength of the reactor itself from a downward force in terms of the maximum force it can certainly withstand without sustaining damage to the core?

n. what is the density of the roof in pounds per cubic feet, and precisely what material is it made of?

o. what is the maximum stress on the roof in pounds placed by the weight of the ten-ton crane and the maximum weight that the crane could conceivably be lifting for reactor purposes?

p. how is the crane attached to the reactor roof and secured there?

q. were a seismic event to occur during unloading of spent fuel from the reactor core, by how much would that reduce the strength of the reactor to withstand a downward force as described in part m above?

r. what is the strength of the fuel handling cask?

s. is there a time during fuel unloading when the reactor core is uncovered and when reactor fuel is not yet in a fuel handling cask?

t. for maintenance that requires dismantling of the reactor core or entry into the reactor core, describe precisely how that dismantling or entry is done?

u. what is the shortest time interval between last reactor run and in-core maintenance?

v. please answer question q above for maintenance that requires core entry or dismantling.

w. what is the reactor roof's weakest point, and what is the strength at that poir

15. Regarding the support columns in the 3rd floor void area containing the equipment room:

a. what is the composition of the columns?

b. are they reinforced, and if so, with what thickness of reinforcing rods, how many rods per columns, to what are they anchored, and in what fashion are they anchored?

c. what weight does each column presently carry or hold up?

d. besides the columns identified in 15 above, what other structural supports are there for the portion of Boelter Hall directly above the 3rd floor void area and reactor room?

e. what portion of the attendant weight of the Boelter portion directly above the 3rd floor void area do the structural supports identified in d above carry or hold up?

f. what mass do the columns in the 3rd floor void area and the additional supports described in answer to d above collectively support?

g. how are the columns fastened and to what are they fastened?

h. what is the strength of the point at which they are fastened and is that point weaker or stronger than the columns themselves?

i. what force would be required to cause those columns to crack, buckle, or be sheared off--both the minimum force that <u>could</u> cause such damage and the minimum force force that <u>would certainly</u> cause such damage?

j. were those columns to crack, buckle, or be sheared off, what is the probability that the portions of Boelter Hall directly above the third floor void area would fall onto the reactor roof?

k. were those portions of Boelter Hall to fall onto the reactor roof, what is the probability of the reactor roof cracking, buckling, or being sheared off its fastenings?

l. were the reactor roof and the above portions of Boelter Hall to fall on the reactor itself, what is the probability of the reactor suffering core damage?

m. were the reactor to suffer core damage as described above, what

is the probability of fuel plates being damaged and fission products being released?

n. were the fuel to be damaged and fission products to be released, what is the maximum % of volatile fission products and maximum % of non-volatile fission products that could be released, were the radioactive core inventory at the time the maximum possible? Please state precisely the figures used for maximum inventory (including # of curies of iodines) and numbers of curies of volatiles fission products and non-volatiles considered released, as well as the numbers of curies of specific isotopes released, including but not limited to the iodines.

o. were the damage to occur during core maintenance or fuel loading, and were that to increase the amount of fuel damage done due to lack of protection from core shielding, what would be the answers to n above?

p. what are the consequential dose estimates, including but not limited to highest dose to nearest member of the public staying 2 hours and staying 8 hours at that location, the total number of person-rems of exposure were the exposure to take place at time of maximum population occupancy near the reactor and were the seismic event to pin substantial numbers of people, injured but alive, so that they were immobile for several hours near the reactor, and the highest thyroid dose and total number of thyroid-person-rems.

16. What is the largest capable fault near the reactor site?

a. Please detail all facts available to Applicant upon which its answer to the above question is based.

b. Please detail all documents in Applicant's possession upon which its answer is based.

c. Will Applicant produce documents identified in b above absent a formal motion to produce?

d. Please indicate what specific efforts were made by Applicant to obtain the information upon which its answer is based.

17. What is the accelerogram--that is, the shape of the curve of acceleration-- for that fault at the reactor site in the worst case senario?

a. Please detail all facts available to Applicant upon which its answer to the above question is based.

b. Please detail all documents in Applicant's possession upon which its answer is based.

c. Will Applicant produce documents identified in b above absent a formal motion to produce?

d. Please indicate what specific efforts were made by Applicant to obtain the information upon which its answer is based.

18. What is the maximum ground acceleration possible and maximum possible magnitude (in Richter Scale) for that fault?

a. Please detail all facts available to Applicant upon which its answer to the above question is based.

b. Please detail all documents in Applicant's possession upon which its answer is based.

c. Will Applicant produce documents identified in b above absent a formal motion to produce?

d. Please indicate what specific efforts were made by Applicant to obtain the information upon which its answer is based.

19. Does Applicant contend that the frequency spectrum (frequency of the acceleration, duration of event, and number of pulses) experienced by the reactor during the experimental vibration tests is indicative of what would be expected in a real earthquake at the reactor site?

a. Please detail all facts available to Applicant upon which its answer to the above question is based.

b. Please detail all documents in Applicant's possession upon which its answer is based.

c. Will Applicant produce documents identified in b above absent a formal motion to produce?

d.Please indicate what specific efforts were made by Applicant to obtain the information upon which its answer is based.

20. Does Applicant assert that the problems which led to pinning of a control blade sometime after the vibration tests and which was suspected of being caused by shifting of the reactor internals during those tests have been corrected so that there would not be shifting of reactor internals and/or pinning of control blades during an earthquake? If so, please detail with specificity:

a. those reactor alterations that have been made to prevent recurrences of this problem.

b. all tests that have been conducted to indicate that indeed the problem cannot recur

c. all facts in Applicant's possession which indicate that the graphite used in the internals of the reactor cannot shift

or otherwise bind the control blades

d. all documents which support or contradict Applicant's answers to 20a-c and whether Applicant will produce said documents absent a formal motion to produce?

21. Has Applicant conducted a Newmark-type analysis modeled for the largest earthquake reasonably expected at the site? If so, identify all such analyses performed?

a. Could the operation of the control blades be maintained through such an event-- not just into the event, but through it?

b. Could the operation of the dump valve and its control mechanisms be maintained through, not just into, such an event?

c. Will Applicant produce all records of Analyses identified in 21 above absent a formal motion to produce?

22. Please provide all information detailing the type, manufacture, placement, testing, operating experience of any and all earthquake sensors (e.g. seismic scram interlocks) built into the reactor designed to scram the reactor in case of earthquake or earthquake precursor.

a. What is its response time--from start of seismic event or precursor to time reactor is fully shut down?

b. What is its threshhold--how much acceleration, ground motion, or magnitude of triggering moment is necessary to be exceeded for the device(s) to shut the reactor down?

c. Have the devices ever in the past shut the reactor down? If so, please provide dates and details.

d. Have the devices ever been tested? If so, please provide dates and results of said tests?

e. Given the accelerogram described in interrogatory 17 above,

how far into the seismic event would the reactor be completely shut down if the safety systems worked perfectly?

f. Could enough core shifting occur prior to that time so that control blade insertion was obstructed?

g. What facts does Applicant have in its possession indicating operating experience of reactors with such devices or of tests involving such devices?

h. What efforts has Applicant made to secure such information?

i. Are the devices designed merely to sense an earthquake precursor?

j. Are they useful even if there is no precursos?

k. What are the probabilities of a precursor sufficient to activate the device prior to the earthquake itself.

l. What documents are in Applicant's possession which form the basis of its answers to 22a-k and that support or contradict those answers?

m. Will Applicant produce said documents absent a formal motion to produce?

23. What does Applicant contend is the maximum acceleration of the reactor core possible in:

a. The east-west direction.

b. The north-south direction.

c. Vertical (up-down and down-up).

24. What does Applicant contend is the maximmum acceleration the reactor core is capable of sustaining without damage in:

a. The east-west direction.

b. The north-south direction.

c. Vertical (up-down and down-up).

25. Please give all facts in Applicant's possession that support or contradict the answers given in 23 and 24 above.

a. In addition, please identify all documents of which Applicant is aware that provide information that can support or contradict the answers given in 23 and 24.

b. Please indicate which of the documents in 25a are in Applicant's possession.

c. Will Applicant produce documents identified in 25b absent a formal motion to produce?

26. Applicant's answer of 8-27-80 to NRC Question 14 regarding the status of a "secure experiment" in the event of an earthquake states:

"Neither the sample, the core, nor the top shielding are secured against vertical downward accelerations greater than 1g. Cohesive forces sufficient to produce downward accelerations greater than 1 g are unlikely, the building and all of its contents would fall at no more than 1 g. The sample would not move relative to the core."

a. Does Applicant currently view this to be an accurate statement?

b. What precisely does applicant mean by "cohesive forces?"

c. On what facts, calculations, studies, experiments, reports, and other documents does Applicant base its statement that neither the sample, the core, nor the top shielding are secured against vertical downward accelerations greater than 1 g? Please provide all facts and calculations, particularly all dynamic analyses, (of the entire seismic event and building responses as opposed to a static response to a single force). Will Applicant provide all such documents absent a formal motion to produce?

d. Precisely what level of downward acceleration are the sample, core, and top shielding secured against? Please provide all facts and

and calculations and identify all documents from which this answer was taken. Will Applicant provide all such documents absent a formal motion to produce?

e. What level of accelerations are the sample, core and top shielding secured against

i) in the upward vertical direction

ii) in the E-W direction

iii) in the N-S direction

iv) laterally

f. Please provide all facts and calculations upon which the answer to e was made. Identify all documents upon which it was based. Will Applicant produce all such documents absent a formal motion to produce?

g. Please provide a drawing of secured experiments in an irradiation port showing the spacer and graphite plug and means of inserting the experiment into the port. What precisely is the spacer made of, and on what is it supported, and how is it secured?

h. Please provide all facts, and calculations upon which this statement is based: "Cohesive forces sufficient to produce downward accelerations greater than 1 g are unlikely." Please identify all studies, experiments,articles, literature searches, reports, and other documents upon which that statement is based. Will Applicant produce said documents absent a formal motion to produce?

i. The above-quoted statement concludes: "The sample would not move relative to the core." Please provide all facts and calculations upon which that conclusion is based. Please identify all documents known to Applicant which support or contradict that conclusion. Will Applicant produce all such documents in

its possession absent a formal motion to produce?

j. Has Applicant done any tests to confirm the statement quoted at the beginning of this interrogatory? If so, please identify all such tests, their dates, and results; also any records that document those tests. Will Applicant produce those records absent a formal motion to produce?

k. Would not an upward acceleration send the sample flying out of the reactor core? Please provide all facts and calculations that support or contradict your answer, and indicate whether you will produce said documents in your possession absent a formal motion to produce?

l. Would not the building falling on the reactor have a far greater impact force upon the reactor than the effect of the ground motion acceleration alone on the reactor?

m. Could not the building fall on the reactor from the first wave of the quake and land upon the reactor at the moment that the second wave or motion produced a downward acceleration or upward acceleration?

n. Does Applicant contend that it is impossible for a dynamic effect of an earthquake event to include several forces acting upon the reactor in different directions within short intervals of each other, the resonance effect of which could jerk the sample out of the core area?

o. Could a "ping-pong" type reaction occur that could cause the sample to bounce out of the reactor core?

p. Could an earthquake crush a sample container? If so, could the contents be squirted out of the core area, or trickle down out of the core area? Please give all facts, diagrams, and calculations in your possession that relate to your answer

and identify all documents so related and indicate whether you will produce said documents absent a formal motion to produce

q. Does Applicant contend that no acceleration greater than 1 g in any direction is possible at this reactor? If so, provide all facts that support that contention, indicate all documents that support it, and indicate whether you will produce said documents absent a formal motion to produce?

27. What is the most likely accelerogram spectrum to which the reactor design must be tested?

a. Has it been so tested?

b. What document(s) is answers to #27 and 27a based on?

c. Will Applicant produce said document(s) without a formal motion to produce?

28. Since Applicant has found a natural frequency within the reactor based on its experimental vibration testing, what dynamic tests has Applicant done at that frequency to simulate true earthquake dynamic conditions?

29. What failure testing (testing to failure) of the reactor's control blade system has been done to assure that they cannot be made to break off, fallout, jump out, or otherwise move relative to the reactor core during an earthquake or other severe shock, causing a sudden reactivity insertion and a potentially destructive power excursion?

30. What analyses have been done indicating the force, twisting, shifting, bending, etc. the blades can withstand without breaking;

a. What analyses have been done showing what force would be necessary to bound the blades out of the core?

b. What is the structurally weakest point for the control blade system?

c. What documents are the above answers to interrogatory 30-30b based and will Applicant produce the documents absent a formal motion to produce?

31. Would an earthquake causing the collapsing building to fall at 1 g onto the reactor structure cause additional accelerations of two or three g's?

a. What failure testing and other dynamic analyses have been done to determine what effect such an impact on the reactor coupled with ground motion would have on the control blades and their position relative to the core? (e.g., flipping control blade up with an upward force and then smack it with a 3 g downward force and see where it flips up and breaks.)

b. What documents is above answer based on and will Applicant produce said document(s) absent a formal motion to produce?

32. Why is Applicant using the "seismic Zone" classification and the Uniform Building Code zoning system as a criterion for evaluation?

a. What does the seismic zone classification system have to do with nuclear reactors?

b. What does the Uniform Building Code have to do with nuclear reactors?

c. What document(s) are in Applicant's possession that support or contradict the answers contained above, and will Applicant produce said document(s) absent a formal motion to produce?

33. What is the principal capable fault which limits reactor design at the UCLA site?

34. What is the specific potential event at that fault which limits reactor design at the UCLA site?

a. What is the strain energy release on that fault which is the limiting condition for reactor design here?

b. What is the accelerogram that would be associated with the event identified in #34 above?

35. What data are in Applicant's possession regarding response of UCLA's structures to the 1971 earthquake? Will Applicant produce said data absent a formal motion to produce?

36. What is the specific damage that occurred to the UCLA reactor from the 1971 earthquake referenced in the 1976 Annual (Specialized Activity) Report on page 3: "The Feburary 1971 earthquake gave rise to minor problems that worsened with time and ultimately required a major maintenance effort in 1972."

a. Precisely, detail each and every problem that the earthquake gave rise to.

b. Precisely detail exactly how each problem worsened with time.

c. Precisely detail the maintenance effort made in 1972 to deal with these problems.

d. What documents are in Applicant's possession (including but not limited to engineering change orders, maintenance logs, etc.) that relate to a,b,and c above. Will Applicant produce said documents absent a formal motion to produce?

37. Applicant's answer of 8-27-80 to NRC staff question 13 indicates that the control/shim blades are "firmly fixed to horizontal drive shafts."

a. Precisely how are they fixed to the drive shafts?

b. What is the thickness and width of the blade at the point of connection to the drive shaft?

c. What is the blade material at the point of connection with the drive shaft?

d. What is the thickness and material composition of the drive shaft at the point of connection?

e. What is the lifetime use of those blades before the connection with the drive shaft becomes questionable?

f. What force can that point of connection between blade and drive shaft successfully withstand?

g. What failure testing experience and/or other tests and/or analyses is Applicant aware of regarding the connection point between the blades and the drive shaft?

h. What documents are in Applicant's possession that above answers are based on, and will Applicant produce said documents absent a formal motion to produce?

38. What is the thickness of the magnesium shroud wall around the control blades?

39. Applicant's 8-27-80 answer to NRC staff question 13 indicates "In regard to the 'frozen-blade' senario with all four blades locked, it may be remarked that the reactor has been operated in a simulation of this mode for many consecutive hours." Please detail the dates, nature, and results of this simulation and all documents relating to it. Will Applicant produce

said documents absent a formal motion to produce?

40. What were the accelergrams and maximum accelerations at UCLA associated with the '52 and '71 earthquakes and how would those compare to the expected maximum possible? What documents are in Applicant's possession that the answer is based on, and will Applicant produce said document(s) absent a formal motion to produce?

41. What data does Applicant possess regarding the seismic experience of the UCLA area during the Long Beach earthquake of 1933? What document(s) is answer based upon, and will Applicant produce said document(s) absent a formal motion to produce?

42. Were any buildings built according to Uniform Building Code standards damaged in Long Beach or nearby because of the Long Beach earthquake? What document(s) is answer based upon, and will Applicant produce said document(s) absent a formal motion to produce?

43. What is the failure point for the top floor of the reactor building--what is the shear stress that can be withstood before it fails? What document(s) is answer based upon, and will Applicant produce said document(s) absent a formal motion to produce?

44. The UCLA Daily Bruin of April 30, 1980, indicates that "University architects are currently conducting a study of buildings on all UC campuses to rank them according to their need for seismic renovation."

a. What is the precise rank of the reactor building, and out of how many in the list?

b. What specific findings were made about the reactor building?

c. What is the precise name of the seismic study referenced in

the above Bruin article?

d. What other seismic studies related to the reactor building and other buildings on the UCLA campus is Applicant aware of?

e. Will Applicant produce those studies identified in c and d which are in its possession absent a formal motion to produce?

45. What is the Maximum Design Earthquake for which this reactor was originally built to withstand.

a. Identify all documents upon which your answer is based.

b. Is Applicant willing to produce all said documents in its possession absent a formal motion to produce?

46. What is the Maximum Design Earthquake Applicant currently believes reactor could withstand?

a. Identify all documents upon which your answer is based.

b. Is Applicant willing to produce all said documents in its possession absent a formal motion to produce?

47. What is the Maximum Earthquake the reactor could possibly experience given its siting?

a. Identify all documents upon which your answer is based.

b. Is Applicant willing to produce all said documents in its possession absent a formal motion to produce?

in the Application

48. Precisely on which pages and which sections of pages/does the information required by 10 CFR 50.34(b)(1) appear?

a. Please provide all information required by 10 CFR 50.34(b)(1) that does not already appear in the Application.

49. A press statement released by the Chancellor of UC Berkeley about the Applicant's research reactor there indicates a number of seismic studies and analyses and scenarios have been prepared about the reaction of the Applicant's reactor in Berkeley to a potential seismic event. Please describe with specificity the types of analyses Applicant has conducted regarding seismic questions of its Berkeley reactor. Please identify each and every such study or document, prepared by Applicant or by others, in Applicant's possession and whether Applicant will produce said documents absent a formal motion to produce.

INTERROGATORIES AS TO CONTENTION XVIII

"Financial Qualifications"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

(a) Please identify each and every such person.

(b) Please state the number of each interrogatory with respect to which that person was consulted.

(c) Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Please identify all academic reviews of the NEL or the Reactor program which have been conducted from 1960 through the present.

(a) Will you produce these documents without a formal motion to produce?

4. Please identify any and all letters, reviews or other documents which contain recommendations to the Dean of the SEAS concerning the financial support of the Reactor program from 1960 through the present.

(a) Will you produce these documents without a formal motion to produce?

5. Please describe in detail the process whereby the final budget appropriation for the NEL or the Reactor program is determined; including but not limited to a description of:

(a) Who prepares the initial budget request?

(b) Who reviews the initial request?

(c) Who makes the final budget appropriation decision?

6. Please identify any and all documents used in the budgetary process from 1960 through the present.

(a) Will you produce these documents without a formal motion to produce?

7. Has the NEL's final budget appropriation ever been less than the initial budget appropriation requistion?

(a) If so, please identify each such year and the amount of disparity.

(b) If so, for each year from 1960 to 1981 for which there was such a disparity please indicate what factors caused or required the decision to reduce the initial budget request.

(c) Please identify for each year any and all documents which would tend to support the existence of the facts or decisions identified in the answer to the previous question.

(d) Will Applicant provide these documents without a formal motion to produce?

8. How is the programmatic need for the Reactor program within the University determined?

9. Please indicate each year from 1970 to 1981 for which NEL expenditures have exceeded NEL appropriatios and revenues.

(a) For each year indicated please specify the amount by which expenditures exceeded appropriations and revenues.

10. For each year from 1970 through 1981 please indicate whether the NEL appropriations and revenues, exclusive of revenues generated by the commercial use of the reactor, have been sufficient to meet the operating costs of the reactor.

11. If conditions were placed upon the reactor operating license requiring facility changes and modifications, how would the Applicant generate the appropriations and revenues necessary for such modifications?

(a) Would efforts outside of the normal budegtary process be contemplated? If so, please describe such efforts.

(b) Who would need to approve increased expenditures?

12. On Page v/7-1 of the Application, Applicant describes plans to install Argon-41 hold-up decay tanks.

(a) How much would it cost the Applicant to install such tanks?

(b) Have any funds been expended to date for the acquisition or installation of such tanks?

(c) If the renewed license were to include a requirement that such tanks be installed would the Applicant have to seek funds in addition to those currently budgeted for the NEL, in order to complete the installation?

(d) If extra funding would be required, how much extra funding would be needed?

(e) What problems, if any, does Applicant foresee in finding such extra funding?

(f) What records exist documenting answers to 12a-e. Will you provide these documents without formal motion to produce?

13. If facility modifications were required by the renewed license that would require the expenditure of $10,000.00, would the Applicant forsee any problems in securing these funds?

(a) If the required modifications were to cost $20,000.00?

(b) If the required modifications were to cost $30,000.00?

(c) At what level of required expenditure for modifications would Applicant foresee problems in securing the necessary funding?

(d) At what level of required expenditure for modifications would Applicant decide that the modifications were too costly to undertake?

14. Has Applicant ever delayed, put off, or not undertaken modifications to the facility, improvements of its equipment, or replacement of its equipment because of difficult obtaining funds necessary for such modifications or improvements?

(a) If so, please describe each such instance that has occured during the years 1970 through 1981?

(b) If so, please indicate the modification or improvement foregone and the cost of completing it.

(c) What committee, or whom among the NEL personnel would make the decision to undertake modifications and improvements?

(d) What records exist documenting a-c; will Applicant provide these documents without a formal motion to produce?

15. Does the Applicant find the following statement contained in Rubin's 1976 Master's Thesis "Atomspheric Dispersion of Argon-41 from the UCLA Nuclear Reactor", to be an accurate statement?

> "However, the required systems [to directly measure the Argon-41] were not available at UCLA and building them would run into thousands of dollars for the ion chambers, and tens of thousands of dollars for a scintillation system. Since virtually no funding existed for this research, finances seemed to preclude the development of the required radioactive decay detection system"

(a) If the Applicant does not find this statement to be accurate please indicate each inaccuracy and why Applicant believes it is inaccurate.

16. If equipment such as described by Rubin, and costing as much as he estimates were required to adequately monitor Argon emmissions, would the Applicant be able to obtain the funds necessary to buy or build the equipment?

17. In a March 13, 1975 letter from Thomas Hicks to the NRC, Mr. Hicks states that the cost of bringing the ventilation system into conformance with the Technical Specifications will be substantial and beyond the means of the NEL or SEAS. He further stated the SEAS was currently seeking University support for the revisions and hoped to accomplish the work within 6 to 9 months.

(a) Did the SEAS ever obtain University support for the revisions?

(b) If not, how did the SEAS and the NEL deal with the non-conformance of the ventilation system to the Technical Specification?

(c) Please estimate how much it would have cost in 1975 to bring the ventilation system into conformance.

(d) Please estimate the cost in 1981 of bringing the ventilation system into conformance with the Technical Specifications.

(e) Please identify any and all documents which would tend to support the estimates given in answer to Interrogatory No. 17 c and d.

18. In its budget requests and justification for the years 1974 through 1981 has the NEL specified the amount of funds needed for maintaining its equipment, updating its equipment, or generally improving its equipment and facilities?

(a) If so, please indicate each year for which this was done.

19. Can Applicant estimate the cost of maintaining and updating the reactor facility equipment over the next ten years? The next twenty years? If so, please provide said estimate.

20. If the answer to Interrogatory No. 19 is affirmative please provide the cost estimates for each year for maintaining and updating equipment included in each of the following systems:

(a) Console panel and instrumentation.

(b) Activation Analysis Laboratory.

(c) Ventilation system.

(d) Radiation monitoring systems within the reactor facility.

(e) The reactor itself.

21. If the answer to Interrogatory No. 19 is negative, how does Applicant plan to give reasonable assurances that it will be able to obtain sufficient funds to operate the facility in compliance with the NEL regulations and without endangering the public health and safety?

22. If the answer to Interrogatory No. 19 is affirmative, but the Applicant is unable to specifically provide the information Interrogatory No. 20, please explain fully the reasons for the inability to respond to Interrogatory No. 20,

and provide any and all information about how Applicant's updating and maintenance estimates would be derived.

23. If the Applicant found itself in the position of not being able to secure the funds necessary to modify or maintain the reactor in such a way as to fully protect the public health and safety, what would it do?

(a) If the reactor were shut down, please describe the process by which such a decision would be made.

(b) If the reactor was to be shut down, would the decision be dependent upon securing the funds necessary to decommission the reactor?

24. If the operating license is not renewed, please indicate how the NEL and SEAS would proceed in securing funds necessary for decommissioning.

25. Page I/3-1 of the Application contains an estimation of the cost of permanently closing down the reactor, will these estimates necessarily increase over time, independent of inflation, due to the increasing contamination of the facility and its equipment?

26. Page I/1-1 of the Application contains a table of NEL revenues for 1978, 1979 and 1980 (est). Please specify for each your sources of income included in the category "Other Income".

27. Please describe amount and source of all NEL income other than SEAS Appropriations and Reactor Earnings for each year 1970 through 1977.

28. Has the Applicant made any provisions to cover the cost of decommissioning the reactor when it is shut down?

(a) If so, please describe such provisions.

29. Have decommissioning costs been considered in the long range budget projections of:

(a) The NEL.

(b) The SEAS.

(c) UCLA.

(d) The University of California.

30. Please identify any and all documents which relate to or contain the long range budget considerations listed in response to Interrogatory No. 29.

31. Would it be necessary to obtain specific legislative approval for the funds necessary to decommission the reactor?

32. Would it be necessary to obtain specific gubernatorial approval for the funds necessary to decommission the reactor?

33. Which of the following factors are considered in determining the SEAS appropriation to NEL for the operation of the reactor?

(a) The number of students in the nuclear engineering program.

(b) The number of students enrolled in the engineering classes that require the use of the reactor?

(c) The number of reactor operator traineees?

(d) The quanitity and quality of research performed by NEL personnel which requires operation of the reactor?

(e) The amount of research performed by other UC researchers?

(f) The amount of research performed by non-UC researchers?

(g) The amount of use by commercial users?

34 For those factors indicated in response to Interrogatory No. 33 please identify any and all documents which specify budgetary priorities, weighting or other means by which the factors are put in priority.

INTERROGATORIES AS TO CONTENTION XIX

"Maximum Credible - Design Basis Accident"

Intervenor herein incorporates by references pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

(a) Please identify each and every such person.

(b) Please state the number of each interrogatory with respect to which that person was consulted.

(c) Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. What is Applicant's definition of the term "maximum credible accident?"

a. What is Applicant's source for that definition?

b. In what documents is that definition found?

c. Will Applicant produce said documents absent a formal motion to produce?

4. What is Applicant's definition of the term "design basis accident?"

a. What is Applicant's source for that definition?

b. In what documents is that definition found?

c. Will Applicant produce said documents absent a formal motion to produce?

5. Should Applicant indicate that it has no definition for either the term "maximum credible accident" or the term "design basis accident", how does it intend to defend against Contention XIX in the absence of such a definition?

In the interrogatories which follow, please take the term "maximum credible accident" to mean a major accident, hypothesized for purposes of site evaluation or postulated from considerations of possible accidental events, that would result in potential hazards not exceeded by those from any accident considered credible. Such a postulated accident should be assumed to result in substantial melting of the fuel with subsequent release of an appreciable part of the maximum radioactive inventory of the core, unless other credible accident scenarios would result in potential hazards which exceed that of fuel melting.

In the interrogatories which follow, please take the term "design basis accident" to mean the most major accident which the reactor was designed to withstand without suffering major damage. "Design basis accident" is thus the most severe accident which the reactor was designed to withstand whereas "maximum credible accident" is to be considered for the purposes of these interrogatories the most severe accident that could credibly occur at the facility, were the worst possible series of events to occur.

Should the Applicant's definitions differ from those above, Applicant is to answer the interrogatories which follow according to the above definitions and thereafter answer the same interrogatories with respect to its definitions.

6. What does Applicant contend is the maximum credible accident for this reactor?

a. Please specify the type and degree of core damage associated with such an accident, including fraction of fuel assumed to be damaged.

b. Please specify the percentage of volatile fission products and the percentage of nonvolatile fission products assumed to be released in such an accident, with specific identification of the percent and amounts of the iodines and strontiums considered to be released.

c. Please specify the postulated scenario or scenarios by which such an accident is hypothesized to occur.

7. What does the Applicant contend is the design basis accident for this reactor?

a. Please specify the maximum type and degree of core damage associated with such an accident, including fraction, if any, of fuel assumed to be damaged.

b. Please specify the percentage of volatile and nonvolatile fission products assumed to be released in such an accident, with specific identification of the percent and amounts of the iodines and strontiums considered to be released.

c. Please specify the postulated scenario or scenarios by which such an accident is hypothesized to occur

8. Please specify all documents, studies, investigations, calculations, tests, experiments, computer simulations, and all other records which form the basis for Applicant's answers to interrogatories 6 and 7.

a. Will Applicant produce all such documents absent a formal motion to produce?

9. In answering interrogatory 6, did Applicant consider each of the following hazard scenarios:

a. maximum credible sabotage

b. maximum credible airplane crash into reactor building

c. maximum credible multiple failure modes (including but not limited to a major earthquake coupled with instrument and/or personnel failures).

d. maximum operator error(s) considered credible.

10. If the answer to interrogatory 9a, b, c, and/or d is affirmative, for each one answered in the affirmative please indicate:

a. all/specific hazard scenarios of the type described that were considered by Applicant in providing answer to interrogatory 6.

b. the maximum core damage and radioactivity release and consequential dose estimate connected with that scenario

c. those specific hazard scenarios of the type described in 9 a, b, c, and/or d that were considered but rejected as not being credible.

11. Please specify all documents, studies, investigations, calculations, tests, experiments, computer simulations, and all other records which form the basis for Applicant's answers to interrogatory 10 and its subparts.

a. Will Applicant produce said documents absent a formal motion to produce?

12. In answering interrogatory 7, did Applicant consider each of the hazard scenarios outlined in interrogatory 9a through 9 d?

13. If the answer to interrogatory 12 is affirmative, for each one of the scenarios 9a through 9d answered in the affirmative, please indicate:

a. all specific hazard scenarios of the type a-d considered by Applicant in providing answer to interrogatory 7.

b. the maximum core damage and radioactivity release and consequential dose estimate connected with that scenario.

c. those specific hazard scenarios of the type described in 9a-d that were considered but rejected as not being necessary to design against.

14. Please specify all documents, studies, investigations, calculations, tests, experiments, computer simulations, and all other records which form the basis for Applicant's answers to interrogatory 13 and its subparts.

a. Will Applicant produce all such documents absent a formal motion to produce?

15. What specific accident or accidents was the NEL reactor initially designed to withstand; i.e. what maximum accident was the NEL reactor's initial design basis accident?

a. What records document the above answer?

b. If there were no original design basis accident, why not?

16. In Applicant's "Statement of Position With Respect to Unstipulated Contentions" dated November 28, 1980, Applicant states on page 14 that "Hypothesizing DC-10 or Boeing 747 airplane crashes is completely arbitrary and hardly credible since the flight paths of commercial airlines do not come anywhere near Applicant's facility nor do they overfly the facility at any altitude."

a. Please indicate with specificity all facts in Applicant's possession that form the basis of the above statement.

b. Please indicate all studies performed or investigations undertaken by Applicant that led to or give support to the above-quoted statement.

c. Does Applicant deny that commercial airliners on approach to Los Angeles International Airport from midnight to 6:00 a.m. when the airport is backed up are put in holding patterns the circles of which may pass over UCLA?

d. If the answer to 16c is affirmative, that the Applicant does so deny, please specify all facts that form the basis of that answer and indicate all studies performed or investigations undertaken related thereto.

e. Please indicate all investigations and studies undertaken and all facts in Applicant's possession as to planes possibly flying over the UCLA campus

i. arriving or departing Hollywood-Burbank Airport

ii. passing over Los Angeles without arriving or departing LA

iii. flying into or out of Santa Monica airport

iv. small plane flying patterns, including but not limited to traffic planes

v. helicopters, including but not limited to those taking off from or arriving at UCLA, in particular the hospital complex

f. Please indicate for all subparts of item e above

i.) whether any of the planes or helicopters could conceivably overfly UCLA

ii.) if so, what the largest such plane or helicopter could be

iii.) if not, what the nearest approach to campus could conceivably be and the largest plane or helicopter making that approach

g. answer questions e and f above also for planes arriving or departing Los Angeles International airport

h. Please indicate all investigations and studies undertaken and all facts in Applicant's possession as to the number of planes and helicopters entering the airspace of the Los Angeles Basin in any one year and

i. the probability of any such plane getting off course so that it passed over UCLA

ii. the probability of a plane in trouble veering off course as it crashed

i. Please indicate all facts in Applicant's possession and all investigations and studies undertaken as to the consequences of a crash into the reactor building of

i. a large plane such as a DC-10 or Boeing 747

ii. a smaller commercial plane

iii. a large private plane

iv. a small private plane

v. a large helicopter

vi. a small helicopter

j. Where would be the worst place for such a crashing plane or helicopter to impact the reactor building in terms of radioactive release consequences?

k. were a plane crash or helicopter crash of the variety identified in i above, what would be the consequences for the reactor, what would be the fission product release, and what would be the consequential public exposures?

INTERROGATORIES AS TO CONTENTION XX

"Inadequate Security"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories. If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. Precisely where is the fresh fuel kept?

4. How many entrances and exits does the room in which the fresh fuel is kept have?

a. Please indicate each entrance and exit location.

5. Describe the door construction, fastening, thickness, composition, and type and nature of locks for the doors mentioned in interrogatories 4 and 4a.

6. Are there television monitors/cameras surveilling either the room itself where the fresh fuel is kept or the entrances to the room?

7. If yes to interrogatory 6:

a. Where are the cameras placed and what is their field of vision?

b. Do the cameras pan?

c. If the answer to b is yes, over what degree of arc and at what interval?

d. Where are the view monitors situated?

e. Are the monitors "manned" 24 hours a day? ("manned" meaning a human person is watching the monitor or a bank of monitors constantly).

f. If yes to e, are the monitors monitored by campus police personnel, NEL personnel, other personnel, or some combination? Be specific.

g. If no to e, how many hours a day are the monitors monitored by a human person constantly? Answer question f in addition.

h. If the monitors are not monitored constantly, are they monitored on a random check basis?

i. If yes, at what interval are they monitored? How many times per day does someone check the monitor, and for how long do they look at the monitor each time? Answer f in addition.

j. Is the signal from the camera (s) videotaped?

k. If the answer to j is yes, where is the videotaping done, is the videotaping record stored after videotape is finished, or is it reused? Is there a videotape loop constantly taping

over itself?

l. Are the cameras on constantly, aside from unusual rare situations?

m. If answer to 1 is yes, precisely what situations involve the cameras being turned off? Must campus police or other security personnel be notified prior to turning the cameras off? If so, who must notify those personnel, in what form, and what is the security personnel response if they do not receive prior notification, or if it is not in a proper form, with proper advance notice, or from the appropriate person?

n. If the answer to 1 is no, what portion(s) of the day and week are the cameras on, precisely? Are the cameras on or off during the work day? Are the cameras on or off at night? Are the cameras on or off during weekends and holidays, and vacations?

o. Are the cameras normally off but triggered by motion or sound or other indication of a human presence in or near the fresh fuel room?

p. If the answer to o is yes, please indicate the triggering mechanism, the manufacturer, make and model of the triggering device and location of the triggering mechanism(s) and sensor(s). If sensor(s) involve "electric eyes", please indicate the height of the light beam(s) and whether visible or some other form of light is used.

q. Is an audio signal involved with the cameras?

r. Is there independent audio monitoring?

s. If the answer to r is yes, please answer questions e through p, substituting "microphone or other audio sensor" for "camera", and "listening post" for "videotape monitoring", and "audiotape" for "videotape."

8. Are there electronic surveillance mechanisms (including but not limited to closed-circuit television and audio monitoring and motion detection, but not including burglar alarms) maintaining surveillance at:

a. The loading zone next to the reactor room used for loading and unloading trucks.

b. The doors into the NEL complex on ground level next to the loading zone (referring here to the side of the doors facing the loading zone as well as the other side of the doors inside the NEL areas).

c. The doors into the NEL complex on the 2nd floor of Boelter Hall, including the door(s) opening onto the second floor walkway as well as the second floor hallway corridor, and referring to either or both sides of said doors.

d. The doors into the NEL complex from the first floor of the Boelter-Math Science complex, again referring to both sides of those doors.

e. All areas not included in a through d that are identified in sections 1 and 2 of contention XX.

f. Any other area in or near NEL.

9. If the answer to any part of 8 is yes, please identify each device, its precise location and type, and for audio and visual surveillance, please answer questions 7a through s for each device identified in response to interrogatory 8.

10. For each device referred to in interrogatories 6,7,8, and 9, please indicate the source of their power supply and what happens to those devices if the power supply is interrupted. If there is a backup power source, please indicate how quickly it can be switched on. Please indicate source

of backup power, location of backup device, and whether wiring to monitoring device is redundant (i.e., if power is interrupted by cutting power line to monitor, whether that also cuts backup power because power goes through the same line. If power lines are redundant, are they redundant throughout, or do the lines connect at some point that can be cut?)

11. How many people and which individual pwople have keys to the area where the fresh fuel is stored?

12. Has anyone with a key to the fresh fuel area ever left NEL employ without immediate rekeying of the facility. If so, give details.

13. In what specific kind of "steel, fireproof safe" (Application, p. V/5-6) are new fuel elements stored? Is it a cabinet with a lock or is it a safe?

a. How thick are the walls of the "safe?"

b. How thick is the door of the "safe?"

c. Does it have a combinati.n lock or a key lock?

d. Who has the combination? If there is a combination?

e. Who has keys, if there are keys?

f. How many keys are required to open the "safe" if keys are required?

g. How many combinations are required to open the"safe" if there are combinations?

h. Is the presence of campus security required in order to either enter the fuel storage area or to open the safe?

i. If yes, is the presence of campus security required by procedure or by some physical means (extra key needed: interlock to be released that can only be released by campus security)?

j. Is the safe rated? If yes, please give its rating, particu-

larly in terms of how resistant to various explosives, acetylene torches, wirecutters, gun shots, drills, electric metal-cutting saws, lock-picking equipment, pass keys, and skeleton keys.

14. What is the maximum amount of fresh fuel that has been kept at the facility during the last twenty years?

15. What is the maximum amount of irradiated fuel kept at the facility during the last twenty years that has had a dose rate at the surface of less than 100 rems per hour?

16. Please provide inventory records for SNM for the period 1906 through the present. Will Applicant so provide absent a formal motion to produce?

17. Please provide the current physical security plan. Will Applicant so provide absent a formal motion to produce?

18. Please provide all previous security plans. Will Applicant so provide absent a formal motion to produce?

19. Please provide all correspondence 1960 through the present dealing with physical security matters, safeguards, security plans, etc. Will Applicant so produce absent a formal motion to produce?

21. Please indicate where all the devices are placed that can set off alarms and what will set them off.

22. On the wall of the outer entryway to one of the doors to NEL from the loading zone there is attached at about ten feet from ground level what appears to be an alarm, with an electric wire coming down from the alarm.

a. Is that an alarm?

b. What will set it off?

c. Can it be cut by cutting the wire?

d. Will cutting the wire set off the alarm or otherwise notify

someone that the alarm has been cut?

23. For all of the devices and alarms indicated in 20 and 21, please indicate whether they can be disarmed

a. By key

b. By loss of power to NEL generally

c. By cutting specific power source for that device or alarm

d. By cutting wiring connecting device with alarm

24. For those devices for which the answers to 23 b or c were affirmative, please indicate if there is backup power automatically available, what the source of that power is, and if that power can also be cut.

25. For those devices and alarms for which the answer to 23 d is affirmative, please indicate whether cutting wiring sets off the alarm or otherwise notifies security.

26. For each alarm indicated in response to interrogatories 21 and 22, please indicate:

a. What is the response supposed to be to that alarm should it go off

i. during the day

ii. during the night

iii. on weekends or vacations

b. Who can cut off each alarm and how.

c. Which alarms are on 24 hours per day and which are off during the workday

d. Which alarms have mechanisms that alert NEL or campus police

personnel when the alarm is not functioning properly.

e. List all incidents in which an alarm(or alarms) went off (other than planned tests) from 1960 to the present.

i. In each case, list the circumstances that caused the alarm(s) to go off, the precise response to the alarm, and any remedial action taken.

27. Precisely what are the most vulnerable parts of the reactor itself to sabotage by explosives?

a. What analyses has Applicant done or has knowledge of regarding these points of potential vulnerability?

b. Will Applicant produce all documents related to these analyses absent a formal motion to produce?

28. Is there anything that would make it physically impossible to insert into the reactor core:

a. dynamite

b. a plastic explosive charge

c. nitroglycerine

d. an incendi ary device

e. a flammable liquid?

29. For all parts of 28 above for which Applicant answered there is a physical impossibility, please describe in detail the device or devices which make such insertion physically impossible.

30. Please describe all components of the third floor equipment room with specificity, including their function, the maximum sabotage that could be done to them and the effect, the maximum sabotage or preparation for attack upon the SNM within NEL that could be done via the third floor equipment room in coordination with some action elsewhere in or near the facility.

Will Applicant produce all drawings of third floor equipment room and its components, and all analyses thereto, absent a formal motion to produce?

31. Does the demineralizer system housed in the third floor void area provide demineralizing services for the primary coolant, the secondary coolant, or both?

a. If the demineralizer does service the primary coolant system, could foreign substances (high reactivity worth and moderating materials that could lead to sudden reactivity changes, explosives or incendiary devices, corrosives that could cause radiation leaks, or other such materials) be inserted into the reactor through modification of piping or other apertures from the 3rd floor equipment room?

b. Could a surge of cold water through such a coolant system cause a sudden reactivity change?

c. Could a slowing of water flow, or temporary stopping of the flow, result in control blades being pulled out to compensate for the lost moderator, and a sudden gush of water manipulated from the 3rd floor, then result in a sudden reactivity increas?

d. What radiation readings are associated with the demineralizer system on the third floor? What could be the maximum hazard associated with sabotage or other damage of that system at that location?

32. Are there any apertures in the third floor equipment room that could be manipulated, for example by removal of a pipe, so that explosives could be dropped into the reactor room? Detail your answer.

33. Are there any openings in the third floor open quad near the equipment whereby explosives could be dropped in the proximity of the reactor room and the rabbit room? Be specific if the answer is affirmative.

34. Are there any steam tunnels through which someone could enter NEL from outside without having to penetrate an alarmed or locked door?

a. Please provide maps of all steam tunnels and indicate all documents which detail Applicant's analyses of the security implications of these steam tunnels. Will Applicant produce said documents absent a formal motion to produce?

35. Are there any crawl spaces in ceilings near NEL that can provide access for someone from the outside without having to go through a locked or alarmed door.

a. Please provide drawings of all crawl spaces in ceilings near NEL and indicate all documents which detail Applicant's analyses of the security implications of these crawl spaces. Will Applicant produce said documents absent a formal motion to produce?

36. Are there crawl spaces in walls near NEL? please detail.

37. Are there any tunnels or crawl spaces under floors other than steam tunnels through which someone could go into NEL or in which someone could hide from campus police after rapid exit from NEL (with or without SNM)? Please detail, indicate all drawings and documents, and whether Applicant will produce said drawings and documents absent a formal motion to produce?

38. Intervenor heard NRC legal counsel at February 5, 1981, pre-hearing conference to argue that Applicant is only required under the appropriate regulations to detect an intrusion, not prevent it. Does Applicant contend that that indeed is its only obligation in terms of security? Please provide all facts which support that assertion , if so made.

39. Counsel for NRC Staff at page 11 of "NRC Staff Motion for Summary Disposition" dated April 13, 1981, states: "Intervenor's assertion that the Licensee's security plan must protect against sabotage is legally incorrect..."

a. Does Applicant concur with the above statement?

b. Does Applicant's security plan not protect against radiological sabotage?

40. Does Applicant's security plan only provide for detection of intrusion or theft, not means for prevention (besides the detection system) of intrusion or theft?

a. If not, please indicate with specificity all measures and devices and protections designed to prevent theft of SNM.

41. What is the largest tour group ever taken through NEL at one time? Please give date and indicate how many NEL personnel accompanied the tour as security personnel.

42. What is the largest tour group permitted to tour NEL at one time under NEL procedures? Please detail those procedures; will Applicant produce written procedures absent a formal motion to produce?

43. Are tour members always signed in before entry on the tour?

44. Are tour members counted before entry, at various locations inside NEL, and upon leaving? If not, how does NEL security measures prevent someone straying away or remaining in NEL facility after tour has left?

45. What training and instructions in security measures do all tour guides have? Please be specific and identify all documents that contain procedures for such training and contain the instructions. Will Applicant produce said documents absent a formal motion to produce?

46. What is the frequency of searches of packages carried by people entering

a) the reactor room

b) the fresh fuel storage room

c) the rabbit room

d) the control room

e) any other part of the NEL facility at which searches are undertaken.

47. What documents contain information relating to Applicant's answer to 46 above? Will Applicant produce said documents absent a formal motion to produce?

48. What is the frequency of presence of watchmen within NEL? What is the frequency of presence of watchmen along the outside border of NEL.

a. What documents provide information related to answer to 48 above? Will Applicant produce said documents absent a formal motion to produce?

49. Regarding the exhaust stack on the 8th floor

a. Is there any physical barrier to pouring an explosive, flammable, toxic, or disabling liquid down the exhaust stack and reaching the reactor room or its proximity? If affirmative, please identify with specificity each and every such barrier.

b. If the top grating on the exhaust stack were removed, what physical barriers would prevent the dropping of solid explosive down the exhaust stack into close proximity of the reactor? Be specific.

c. Is there any physical manner by which someone could divert the exhaust from the exhaust stack (1) into a conduit for the airconditioning equipment located in the stack complex and thus into the populated building (2) downward into the Boelter-Math Sciences Quad, or (3) back down into NEL simply by preventing flow out of the exhaust stack, coupled with someone inside the NEL complex disconnecting the radiation scrams and alarms.

50. Are there at NEL any:

a) gun detectors

b) explosive detectors

c) SNM detectors

51. How much irradiated fuel can Applicant have outside of the core and still run the reactor within the licensed SNM limits? What is the minimum dose rate at 3 feet that any such stored fuel has had after longest storage? What is the specific storage inventory over the license period 1960 through 1981, and what was the dose rate for each of those years?

52. If the reactor is down for major maintenance, how long does it take before that irradiated fuel gets down to a dose rate of less than 100 rem at 3 feet unshielded? Has the reactor ever gone that long a time without running in the past? Is there anything in the license or proposed technical specifications that would prevent that long a "down" time? How much irradiated fuel is currently on site outside the reactor core and what is its dose rate at 3 feet unshielded? For how long a period was the irradiated fuel shipped out in June 1980 stored at NEL outside the reactor core (by core we mean the six fuel boxes in which fission takes place)? For what percent of that storage period was the dose rate less than 100 rems at 3 feet unshielded?

53. Please describe with specificity each and every lock employed at NEL, as well as to the 3rd floor equipment room and 8th floor exhaust stack area; how many keys there are to each lock; and describe in specificity the key type.

54. What would prevent someone from having such a key copies by a person with locksmithing tools who was willing to ignore any note on the key to the effect of not copying it?

55. Is it possible to turn off all the alarms and enter all areas of NEL with the keys in the possession of a single individual?

56. If the answer to 55 above is yes, how many individuals at NEL have a set of keys that makes possible full access to the entire facility?

57. Were a single individual at NEL who ~~would~~ had access to such a single

set of keys to wish to do so, could he or she successfully remove the fresh fuel from NEL without immediate response by campus police?

a. could such an individual turn off all appropriate alarms?

b. could such an individual notify the campus police of alarms about to be turned off so that there was no response?

Please provide detailed responses as to how someone could do the above, or what reasons make such a thing impossible.

58. If a single person at NEL with a single set of keys and access to any code required to dis-alert the campus police and any combination to open the SNM safe could indeed gain access to the SNM and remove it without detection (at least until SNM was noticed to be missing), how can Applicant say it has a security plan sufficient to detect an attempt to divert SNM?

59. If a single person at NEL (for example the lab Director, Manager, Supervisor, or Senior Reactor Operator) has access to all areas of the facility, and if only one individual is needed for entry into the fresh SNM area and opening of the safe, what part of the physical security plan could successfully prevent a small group of terrorists from waiting outside the NEL door for one of the senior staff to leave at the end of the day, put a gun up against him, wait until late evening and force that individual to open the vault and turn off the alarms and notify the campus police of authorized entry (with a threat of immediate death if the campus police were notified).?

60. What in Applicant's physical security plan would prevent a visitor on a tour from leaving a backpack or purse against the reactor or against the reactor room, filled with high explosive timed to go off at some later point? What in Applicant's physical security plan would detect such a threat and prevent it?

61. What in Applicant's physical security plan could successfully prevent a group of terrorists from taking a tour of the reactor, part of a public tour with a single NEL guide, pull out guns, take hostages, force NEL staff to open fresh fuel room and safe, first forcing them to turn off the alarms and notify campus police of authorized entry (under threat of shooting hostages), and walk out of the reactor area into the adjacent loading zone and a waiting truck and drive off with bomb-grade uranium?

62. What would prevent a determined intruder from night after night setting off the alarms so that the campus police no longer respond or NEL personnel bypass them until they can find out what is mechanically wrong?

63. Should a Windscale-type fire, Borax-type excursion, or other such accident occur at the reactor, could operation of the coolant system be vital to the diminution of the accident's impact on public health and safety?

64. Are any parts of the coolant system or related systems found in the third floor equipment area or on the 8th floor roof area? if so, please specify precisely what systems performing what functions.

65. Were an accident to occur involving radioactivity release, the dampers in the exhaust stack or to close automatically to prevent radioactivity release into the environment. Is the proper function of those dampers considered vital in case of accident in terms of protecting public health and safety following such an accident? If not, why not?

a)If so is there any way whereby a prankster or saboteur could, by dropping something down the exhaust stack made the operation of those dampers incapable of performing their required function?

b) Are the dampers or any related structures made of a material that could corrode or rust should they come in contact with significant quantities of water?

c) Can the movement of the dampers be restricted by releasing into the exhaust stack a substance that could "goo" the dampers up?

c) Could movement of the dampers or complete closure be inhibited by dropping of a device that could "hang up" the dampers?

66. Are the exhaust fans for the reactor exhaust stack located on the 8th floor roof? Are those fans vital for proper operation of the reactor? Can the reactor safely run with malfunction or destruction of those fans?

INTERROGATORIES AS TO CONTENTION XXI

"Emergency Response Plan Inadequate"

Intervenor herein incorporates by reference pages i through vii of this submission relating to definitions and general provisions to be used in answering these interrogatories.

1. Have the person(s) preparing the answers to these interrogatories read the definitions and general provisions for these interrogatories which are set forth on pages i through vii above?

2. Has any person or persons, other than Applicant's attorneys, furnished information of any type whatsoever used by Applicant in answering the following interrogatories or provided other assistance in the preparation of the following interrogatories? If so,

a. Please identify each and every such person.

b. Please state the number of each interrogatory with respect to which that person was consulted.

c. Please indicate the nature of the information or other assistance which that person supplied to Applicant in preparation of the answers to these interrogatories.

3. What personnel are required during the operation of the reactor, at the reactor site and elsewhere, without which operation does not take place?

4. When the reactor is shut down, how is the "on-duty" operator designated.

a. And by whom?

5. Is there at <u>all</u> times a <u>named</u> individual person (as opposed to a <u>title</u>) who is designated the "on-duty operator"?

a. Who selects this person, and how?

6. If this "on-duty operator" is, by ommission, not selected at any given time in accordance with procedure (see previous question), is there an automatic default designation of a specific, named individual?

a. If so, please describe this designation procedure.

7. At all times does a unique, named individual know that he or she is the designated on-duty operator?

a. If so, how does this person know when he or she assumes, and is relieved of this duty?

8. Is the name of the "on-duty operator" always available at the reactor site and to the campus police?

9. What program is there for assuring at any one instance the availability and accuracy of measurement and protective equipment as specified in section 2.2 of the Emergency Response Plan included in the Application-- "Equipment Available"?

10. Does procedure exist for notifying the "on-duty operator", or for posting notice at the reactor control area, of the nonavailability of any listed (Section 2.2 of the Emergency Response Plan in the Application) "Equipment Available" due to obsolescence, recalibration, repair, or other

reason? If so, what is this procedure?

11. Does a procedure exist that keeps up-to-date the Reactor Emergency Call List with respect to names and phone numbers. If so, how often is it updated?

12. Does a procedure exist for the simulation of a reactor emergency?

a. If so, describe this procedure.
b. Does this procedure include determining the location of and functionability of all emergency manuals, phone lists, signs, "health physics suitcase" (Section 1.2.11 at IV/1-3 of the Emergency Response Plan found in the Application) and all necessary equipment needed to implement emergency plans.
c. What is the minimum,average and maximum time needed to reach one of the "key personnel" on the Reactor Emergency Call List (Section 3.2 at IV/3-2 of the Emergency Response Plan found in the Application)?
d. List all dates when said simulations have taken place, 1960 through the present.

13. What is considered to be a reasonable response time by someone on the "key personnel" of the Reactor Emergency Call List, in responding to a reactor emergency? How is this time determined, and by whom?

14. Is a procedure established which assures the availability of key personnel necessary for evacuation and/or other emergency decisions, and implementation of those decisions; during reactor operations and when

the reactor is shut down?

a. If so, describe this procedure.

b. If so, what is the minimum set of such personnel needed, and how was the set determined?

15. What is the alternative emergency procedure if none of the key personnel (see question 12c.)can be reached in case of emergency?

16. Why is there a prohibition in the proposed Emergency Plan against notifying non-university persons or agencies until instructions to do so are issued by the campus police?

a. What advantages and disadvantages were foreseen in the said policy when it was established?

b. How were these advantages and disadvantages balanced against one another?

c. What was the final rationale for deciding not to notify non-university persons or agencies until instructions are issued by campus police? Who made the final decision?

17. To what extent will the prohibition policy delay the emergency response of other persons or organizations and how is this delay justified?

18. What criteria are the campus police to use in deciding to notify non-university persons?

a. Are these criteria explicity posted where accessible to the university police in a reactor emergency?

b. Is a person qualified to make this decisions always aware

possible
of the need to do so while on duty?

19. Who must be notified and whose approval is required for an evacuation of Boelter Hall and the Math-Sciences building?

a. What is the reason for requiring that these persons be notified or that these persons approve any such evacuation?

b. If such person or persons are not immediately available at any time, who has the authority in his/her/their place?

20. Do personnel substituting for above said authority know the full extent of their responsibility regarding reactor emergencies?

21. Do the "on-duty operator" and campus police know, at all times, who must be notified for approval, and how to immediately reach such persons?

22. Describe any determination mode, and any available estimate, of the delay time in obtaining approval to evacuate Boelter Hall and the Math Sciences building under the present plan,including during weekends, nights, and holiday periods.

23. What criteria are to be used by persons authorizing an evacuation of Boelter Hall and/or the Math-Sciences building, in determining whether to order such an evacuation, and how were the criteria established, and by whom, and when?

24. Whose notification and/or approval is required for an evacuation of the entire UCLA campus?

a. If such person or persons are not immediately available

at any time, who has the authority in his/her/their place?

b. Do the personnel with this backup quthority know that they are on duty for this purpose?

25. Do the "on-duty operator" and Campus police know, at all times, who must be notified for approval, and how to immediately reach such persons?

26. Describe any determination made and any available estimate and its determination, of the time delay in obtaining approval to evacuate the UCLA campus under the present plan, including during weekends,nights, and vacation periods.

27. Is the "health physicist" described in the proposed Emergency Plan a specific individual or a rotating position?

a. Is someone designated "the health physicist" always immediately available, and does that person know that he or she is so designated at the time?

b. At all times is the name of the person designated "the health physicist," and the means of immediately reaching that person, always available at the reactor site and to the campus police?

c. If the health physicist cannot be immediately reached, is there a backup person with the same authority available and known to him/herself, the reactor "on-duty operator", and the campus police?

d. Describe any determination of the time necessary to reach the health physicist including at night, weekends, and during vacation periods.

e. Does the health physicist have a paging system to notify him/her when away from a phone?

28. What minimum number and types of radiation monitors are required to be available to the "on-duty operator" during reactor operation, and again during reactor shut-down periods? (See Application, pg. IV/1-2, Section 1.26)

29. When a "nuclear hazard" is declared based on off-scale (high) radiation-monitor readouts, why does this determination only occur when three of the eight monitors read off-scale from an undetermined cause? (App. IV/A-1)

a. If one or more radiation monitors are off-scale (high) for known reasons, what criterion is used to designate a "nuclear hazard," and why?

b. If the number of operational radiation monitors is decreased or increased, what will the criteria be, with respect to number, location, and readouts, for a determinationof a"nuclear hazard"?

30. Describe the present quantity and type of radiation monitors used to determine a nuclear hazard and a reactor emergency, and how they were determined adequate for these purposes, and by whom, and when.

31. Describe present plans for the evacuation of the entire UCLA campus, including during weekends, nights, vacations, holidays, and during rush-hour traffic periods.

a. Have such plans ever been tested or implemented? If so, list all dates of said occurrances.

32. Describe any estimates of the time involved and personnel required to evacuate the campus at any time of day and year, and how they were determined.

33. What liabilities does the university expose itself to by declaring and effecting a campus-wide evacuation, for an evacuation which is subsequently determined to not have been necessary, and for an evacuation that is subsequently determined to have been necessary, with respect to people on campus and those off campus?

34. Describe what criteria exist for the determination as to whether to evacuate the campus, and how those criteria were established, and by whom, and when.

35. Describe provisions for handling injuries in the case of an evacuation of an area which includes the UCLA Medical Center.

36. Describe provisions for handling injuries in the case of a radioactive contamination of the Emergency Medicine Center (See Section C.3 at IV/C-2 of the Emergency Response Plan in the Application.

37. Describe provisions for supervising and handling of exposed or contaminated and/or injured persons in the case of exposure or contamination of the Emergency Medicine Center medical personnel.

38. What evacuation plans exist for the UCLA Medical Center?

39. What assurance is there that equipment listed in the Emergency Response Plan will be in the listed locations in appropriate quantities and usable condition when needed?

40. Who determines what is adequate equipment and that it is properly maintained and kept available?

41. Describe all training exercises and emergency drills and the means and basis for assessing their adequacy in simulating or predicting real emergency responses .

a. List the dates of any such exercises and drills.

42. What documents exist regarding evacuation plans for NEL, Boelter Hall, UCLA Medical Center, and the entire campus?

a. Will you provide said records absent a formal motion to produce?

Dated: April 20, 1981

Mark S. Pollock
Attorney for Intervenors
COMMITTEE TO BRIDGE THE GAP

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	Docket No. 50-142
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	)	
	)	(Proposed Renewal of Facility License)
(UCLA Research Reactor)	)	
	)	

DECLARATION OF SERVICE

I hereby declare that copies of "Intervenor's April 20, 1981, Interrogatories to Applicant, Regents of the University of California" in the above-captioned proceeding have been served by me on the following by deposit in the United States mail, first class, this 20th day of April, 1981:

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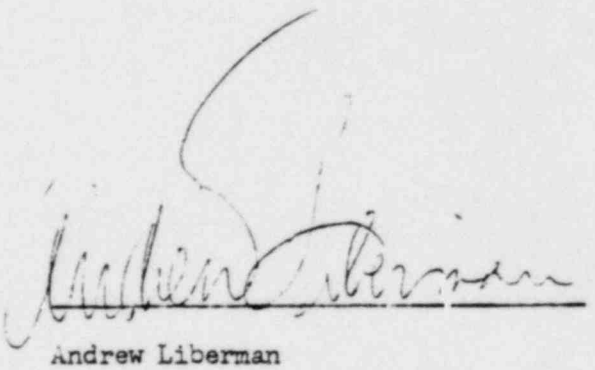

Andrew Liberman