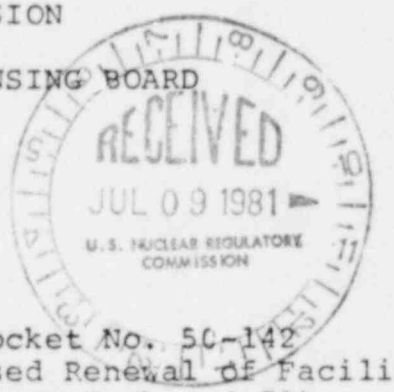
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD



In the Matter of	
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	Docket No. 50-142 (Proposed Renewal of Facility License Number 4-71)
(UCLA Research Reactor)	June 29, 1981

APPLICANT'S SUPPLEMENTAL RESPONSES TO INTERVENOR'S SECOND SET OF INTERROGATORIES

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THE REGENTS OF THE UNIVERSITY
OF CALIFORNIA

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S01/1

Applicant, THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, submits the following responses as a supplement to Applicant's "Answers to Intervenor's Second Set of Interrogatories," dated May 20, 1981.

I. SUPPLEMENTED RESPONSES

Supplemented Response to Interrogatory No. 17d through g (Contention I).

The information requested is contained in the report "Class Use of the UCLA Reactor" which is appended to these Supplemented Responses as "Exhibit A."

Supplemented Response to Interrogatory No. 35 (Contention II).

See the supplemented response above.

Supplemented Response to Interrogatory No. 39 (Contention II).

See the supplemented response above.

Supplemented Response to Interrogatory No. 42 (Contention II).

Actual run time was 381 hours.

Supplemented Response to Interrogatory No. 46 (Contention II).

See "Exhibit C" attached to "Applicant's Further

Answers to Intervenor," dated June 11, 1981.

Supplemented Response to Interrogatory No. 20 (Contention III).

The definition is given in item 1.16 of the proposed technical specifications.

Supplemented Response to Interrogatory No. 43d (Contention III).

The procedures are available in the control room. Emergency procedures are posted in the control room and many other places within the facility.

Supplemented Response to Interrogatory No. 9a (Contention IV).

Applicant did not consider the "failures or malfunctions" as reportable occurrences.

Supplemented Response to Interrogatory No. 20 (Contention IV).

Not to Applicant's knowledge.

Supplemented Response to Interrogatory No. 8c (Contention VI).

The data and its interpretation were discussed in the 1978 Annual Report to the Commission.

Supplemented Response to Interrogatory No. 11a (Contention VI).

The "validity" and "accuracy" relate to the instrument. The instrument was correctly recording data. However, it was not the data that was expected, since Applicant had not anticipated that the readings would be affected by the concrete. The accuracy question was discussed in a report to the Commission titled "The UCLA Reactor is Safe." Applicant has no doubts about the validity and accuracy of its TLD data.

Supplemented Response to Interrogatory No. 25a (Contention VI).

The location was 4150 Center Street, Culver City, California.

Supplemented Response to Interrogatory No. 36c (Contention VI).

The Application for Amendment 10 chose utilization of the conference room as occupancy limiting. In-transit and elevator waiting periods were assumed to yeild occupancy of five months for each hour of conference room utilization (25 hours per week), or less than 5 percent of the 45 hour work week. (See Safety Analysis of Amendment 10, May 16, 1975.)

Supplemented Response to Interrogatory No. 40 (Contention VI).

a. Penetration of concrete walls and floors was neglected. This was a simplifying assumption based upon the high attenuation of gamma-rays in concrete and the opinion that a substantial transport of radiation would require oblique rays of long path length.

b. The shielding effect of partitions was assumed to be zero.

c. Because it was assumed to be negligible.

Supplemented Response to Interrogatory No. 41b (Contention VI).

Occupancy can reach 100% only if the same individual or group occupies the area continuously for all hours that the reactor might operate. The occupancy factor assumed is the largest one for any specific individual or group exposed; it is not the summation of the occupancy factors of all groups exposed. If another particular group or individual is determined to occupy the area a greater amount of the relevant time period then that group or individual's occupancy is used to calculate a new occupancy factor.

Supplemented Response to Interrogatory No. 47a (Contention VI).

Relevant information requested can be found on the same page of the same document cited in the interrogatory. As explained there the distance "r" from the plume center line to location "G" is stated to be 8.79 meters.

Supplemented Response to Interrogatory No. 9c (Contention VII).

Applicant schedules monthly meetings to discuss operating procedures.

Supplemented Response to Interrogatory No. 7d (Contention VIII).

The fission products identified in the application, page III/B-3, are iodine, bromine and krypton isotopes. The longest lived fission product of each of these species which might reasonably qualify as "a short-lived isotope" is"

I-131 -- 8.04 days

Br-83 -- 2.40 hours

Kr-85m -- 4.48 hours

The response to Interrogatory No. 5a (Contention VIII) is applicable. Seven half-lives of I-131 is 56 days.

Supplemented Response to Interrogatory No. 18 (Contention VIII).

If the question pertains generally to a core inventory "that can be contained," Applicant submits that all fission products can be contained up to, and well beyond, the burn-up of available excess reactivity. If the question pertains generally to a core inventory that may actually exist, then the most relevant information is contained in NUREG/CR-2079 ("Analysis of Credible Accidents for Argonant Reactors"). That report contains a table listing some of the isotopes specified in the question. The table describes the volatile constituents in one fuel element following continuous operation at 100 kw for one year.

II. CONCLUSION

Applicant is continuing to derive information to

respond to certain other questions of Intervenor's Second Set of Interrogatories and will supplement its responses further as soon as it has obtained the information.

Dated: June 29, 1981

DONALD L. REIDHAAR
GLENN R. WOODS
CHRISTINE HELWICK

By Glenn R. Woods
Glenn R. Woods

EXHIBIT A

UNIVERSITY OF CALIFORNIA

LOS ANGELES

Class Use of the UCLA Reactor

by

C. E. Ashbaugh

June 29, 1981

University of California, Los Angeles

Class Use Of The UCLA Reactor

A. CNTE Engineering Courses:

1. Engineering 135AL-Nuclear Analysis Laboratory I,

4 hours, Fall Quarter. 2 units
Enrollment 4 to 12 students
Instructor: Mr. Charles Ashbaugh

Description:

A laboratory course in nuclear engineering comprised of various experiments in reactor core physics and related fields. Four of the principal experiments use the reactor and measure fundamental properties i.e. reactor operations, thermal diffusion length in graphite, subcritical neutron multiplication via approach to critical and control rod calibrations.

The laboratory course includes lectures, reactor time, and student use of analytical counting instruments. Also, included are non-reactor nuclear experiments.

Time Distribution	Hours/Class
Lectures and non-reactor experiments	29
Reactor Hours	9
Instrumentation hours due to Reactor use.	2
Total	40

2. Engineering 135BL-Nuclear Analysis Laboratory II,

4 hours, Winter Quarter-2 units
Enrollment 4 to 12 students
Instructor: Mr. Charles Ashbaugh

Description:

A continuation of Engineering 135AL in which five of the experiments require use of the reactor. These experiments include the following: thermal neutron flux profile of the center vertical irradiation port via gold foils, thermal flux profile by step perturbation, reactor kinetics, temperature coefficients and flux tilt, and INAA (gamma ray spectrometry).

Time Distribution	Hours/Class
Lectures and non-reactor experiments	27
Reactor hours	9
Instrumentation hours due to reactor use	4
Total	40

3. Engineering 135F Experimental Reactor Operations, Control and Safety

4 hours, Spring Quarter-2 units
Enrollment 4 to 6 students
Instructor: Mr. Charles E. Ashbaugh

Description:

A laboratory course concentrating on the operation of the UCLA reactor. Experiments performed on the reactor are those which are not performed in Engineering 139A, Engineering 135AL or Engineering 135BL. The experiments cover measurements of various core parameters, control system responses and the evaluation of various safety systems. Certain qualified students will take the NRC reactor operator liscensing exam several weeks after class completion and after a minimum of 40 hours at the reactor console. Approximately half of the reactor time per student is outside of the formal class hours.

Time Distribution	Hours/Class
Lectures and Discussions	40
Reactor Operations	>40/student
Total	>80

4. Engineering 139A-Introductory Chemical Nuclear and Thermal Engineering Laboratory

8 hours, Fall, Winter, Spring Quarter
4 units
Enrollment 25 students
Instructors: CNTE Faculty.

A required laboratory course involving each of the three disciplines in the Department of CNTE. Each student is required to perform eight one week experiments. The two nuclear experiments are radiation and calibration of counting equipment and neutron activation analysis and identification of unknowns. The students perform their own irradiation under supervision of an SRO with the class divided up into four sections with each section spending two weeks at NEL.

Time Distribution	Hours/Class
Lectures pertaining to nuclear experiments:	4x3=12
Reactor hours	4x1=4
Instrumentation hours due to reactor use:	4x12=48
	Total=64

B. Non CNTE Courses

1. Physics 180A-Nuclear Physics Laboratory

8 hours, Winter and Spring Quarters
4 Units
Enrollment 10 students

Instructors: Dr. George Igo/Dr. Jean Oostens

A laboratory course comprised of various experiments involving nuclear physics. The reactor portion of the class involves student participation in the production of F^{20}, S^{37}, Na^{24}, Cd^{115} and the irradiation of flints. The analysis is performed using NEL's instrumentation.

Time Distribution	Hours/Class
Lectures and non-reactor experiments	66
Reactor Hours	2
Instrumentation hours due to reactor use	12
Total	80

2. Chemistry 184 - Instrumental Analysis

12 hours, Fall and Spring Quarters
4 Units
Enrollment 20
Instructors: Dr. John Wasson/Dr. Derek Sears

A lecture/laboratory course covering the theory and practice of instrumental techniques such as atomic absorption spectroscopy, mass spectrometry, gas chromatography, x-ray fluorescence and through the use of the reactor, gamma ray spectrometry for neutron activation analysis.

Time Distribution	Hours/Class
Lectures and non-reactor experiments	98
Reactor Hours	6
Instrumentation hours due to reactor use.	16
	120

3. Chemistry 221K-Nuclear Chemistry and Neutron Activation

6 hours, Spring Quarter
4 units
Enrollment 10
Instructor: Dr. John Wasson

A lecture/laboratory course covering the various disciplines of nuclear chemistry such as radioactive decay, radiochemical separations and various nuclear analysis techniques. Use of the reactor is required to perform neutron activation analysis and subsequent gamma ray spectrometry.

Time Distribution	Hours/Class
Lectures and non-reactor experiments	32
Reactor hours	10
Instrumentation due to reactor use	18
Total	60

4. Earth and Space Sciences 298 Neutron Activation Analysis

4 hours, Spring Quarter
2 units
Enrollment 5
Instructor: Dr. John Wasson/Mr. G. W. Kallemeyn

A laboratory course on neutron activation analysis and gamma ray spectrometry taught in conjunction with Chemistry 221K. The students participate in their own sample handling and irradiations.

Time Distribution	Hours/Class
Lectures and non-reactor experiments	12
Reactor use	6
Instrumentation hours due to reactor use.	22
Total	40

5. University Engineering Extension 497.17-Nuclear Reactor Theory and Operations

3 hours, Spring Quarter
4 units
Enrollment 10
Instructor: Mr. Charles Ashbaugh

An engineering extension course covering the various aspects of nuclear reactor theory and operations. The course covers reactor core physics, health physics and instrumentation and includes an experiment on the reactor.

Time Distribution	Hours/Class
Lectures and exams	33
Reactor Use	3
Total	36

C. Course Cancelled

1. Engineering 139B-Chemical and Thermal Engineering Laboratory

8 hours, Spring Quarter
4 units
Enrollment 25
Instructors: CNTE Faculty

This course required students to perform four, two week experiments on a rotation basis. The two week neutron activation analysis and gamma ray spectrometry experiment was included in the course during the years 1977 through 1979. Due to instructor time conflicts, the reactor experiment was cancelled. Students wishing to learn INAA were to enroll in other courses which cover this material.

* First Offering (1980-1981)
(-)=Per Student basis when class is subdivided

CLASS USE OF UCLA REACTOR

Class	Units	Students per qt.	Students per yr.	Reactor Hrs Per Quarter	Reactor Hrs. Per Year	Student Reactor Hours/Year	Instrumentation Hours/Class	Student Instrumentation Hours/Year	Offeri Per Year
Engineering 135AL	2	4-12	4-12	9	9	36-108	2	8- 24	1
Engineering 135PL	2	4-12	4-12	9	9	36-108	4	16-48	1
Engineering 135F	2	4-6	4-6	>100	>100	200-300	N/A	N/A	1
Engineering 139A	4	25	75	(1) 4	(1) 12	75	(12) 48	900	3
Physics 180A	4	10	20	2	4	40	12	240	2
Chem 184	4	20	40	6	12	240	16	640	2
* Chem 221K	4	10	10	10	10	100	18	180	1
* ESS 298	2	5	5	6	6	30	22	110	1
Engineering X 497.17	4	10	10	3	3	30	N/A	N/A	1
Engineering 139B	See C-1								
TOTALS	Units offered per year 44	-	172-190	-	>165	787-1031	-	2094-2142	13

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THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	)	(Proposed Renewal of Facility License Number R-71)
	)	
(UCLA Research Reactor)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the attached: APPLICANT'S RESPONSE TO INTERVENOR'S MOTION TO COMPEL AND REQUEST FOR PRODUCTION

in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, postage prepaid, addressed as indicated, on this date: June 30, 1981.

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