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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
	)	(Operating License Renewal)
	)	
(UCLA Research Reactor)	)	

NRC STAFF MOTION FOR SUMMARY DISPOSITION

Colleen P. Woodhead
Counsel for NRC Staff

Dated at Bethesda, Maryland
this 1st day of September , 1982

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NRC STAFF MOTION FOR SUMMARY DISPOSITION OF EIGHTEEN CONTENTIONS

I. THE MOTION

Pursuant to 10 CFR § 2.749 of the Commission's Rules of Practice, the NRC Staff moves the Atomic Safety and Licensing Board for summary disposition of 18 contentions admitted to this proceeding. In support of its motion, the Staff will show by affidavit and discussion that no genuine issue of material fact exists to require litigation of the contentions and that it is entitled to a decision as a matter of law.

II. INTRODUCTION

The University of California received its original Class 104 Operating License for the research reactor at the Los Angeles Campus in 1960. A Class 104 license renewal was issued by the Commission to the University in 1971 according to 10 CFR § 50.21(c). The reactor normally operates at low power levels up to 100 kilowatts on an intermittent schedule (approximately 200-300 hours per year) according to the particular needs of the University. Due to the expiration date of the 1971

license, application was made by the University for renewal of the Class 104 license on February 28, 1980.

On April 25, 1980, the Commission published a Federal Register Notice[1/] allowing opportunity for intervention in the Commission's consideration of this second license renewal. The Committee to Bridge the Gap (CBG) filed a timely petition to intervene and was admitted as a party to the proceeding at the special prehearing conference on September 25, 1980 after submitting more than twenty contentions. After another special prehearing conference was held on February 4-5, 1981, the Board by Order of March 20, 1981 admitted sixteen contentions in addition to four admitted in September 1980, thus bringing the total number of contentions admitted for litigation to twenty.[2/] Discovery began with filing of first round interrogatories on April 20, 1981.

III. DISCUSSION

A. Legal Standards for Summary Disposition

The Commission's Rules of Practice provide for summary disposition of certain issues on the pleadings where the filings in the proceeding show that there is no genuine issue as to any material fact and that the movant is entitled to a decision as a matter of law. 10 CFR § 2.749(d).

Use of summary disposition has been encouraged by the Commission and the Appeal Board to resolve contentions where the intervenor has failed to

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1/ 45 Fed. Reg. 28028.

2/ The Staff filed a motion for summary disposition of Contention XX on April 13, 1981. Thus, the present motion concerns all but two of the admitted contentions. Intervenor has not submitted a revision of Contention XXI to address the Applicants' July 29, 1982 revised emergency plan.

establish that a genuine issue exists. Northern States Power Co. (Prairie Island Nuclear Generating Plant, Units 1&2), CLI-73-12, 6 AEC 241 (1973) aff'd sub nom BPI v. Atomic Energy Commission, 502 F.2d 424 (D.C. Cir. 1974); Mississippi Power & Light Co. (Grand Gulf Nuclear Station, Units 1&2), ALAB-130, 6 AEC 423, 424-25 (1973); Duquesne Light Co. (Beaver Valley Power Station, Unit 1), ALAB-109, 6 AEC 243, 245 (1973), Houston Lighting and Power Co. (Allens Creek Nuclear Generating Station, Unit 1) ALAB-590, 11 NRC 542, 550 (1980). Statement of Policy on Conduct of Licensing Proceedings, CLI-81-8, 13 NRC 452, 457 (1981).

The Commission's rule authorizing summary disposition is analagous to Rule 56 of the Federal Rules of Civil Procedure. Alabama Power Co. (Joseph M. Farley Nuclear Plant, Units 1&2), ALAB-182, 7 AEC 210, 217 (1974); Gulf States Utilities Co. (River Bend Station, Units 1&2), LBP-75-10, 1 NRC 246, 247, (1975); Public Service Co. of New Hampshire (Seabrook Station, Units 1&2), LBP-74-36, 7 AEC 877, 878 (1974); Cleveland Electric Illuminating Co. et al. (Perry Nuclear Power Plant, Units 1&2), ALAB-443, 6 NRC 741, 753-54 (1977). 6 Moore's Federal Practice, p.56-21 (2d ed. 1976).

In Federal practice, Rule 56 authorizes summary judgment only where it is quite clear what the truth is and where no genuine issue remains for trial. Sartor v. Arkansas Natural Gas Corp., 321 U.S. 620, 627 (1944); Poller v. Columbia Broadcasting System, Inc., 368 U.S. 464, 467 (1962). And the record will be viewed in the light most favorable to the party opposing the motion. Poller v. CBS, supra, at 473; Crest Auto Supplies, Inc. v. Ero Manufacturing Co., 360 F.2d 896, 899 (7th Cir. 1966); United Mine Workers of America, Dist. 22 v. Roncco, 314 F.2d 186, 188 (10th Cir. 1963). The Commission follows these same standards in considering summary disposition motions. Perry, ALAB-443, supra at 754; Public Service Co. of New Hampshire

(Seabrook Station, Units 1&2), LBP-74-36, 7 AEC 877, 879 (1974). The burden of proof lies upon the movant for summary disposition who must demonstrate the absence of any genuine issue of material fact. Adickes v. Kress and Co., 398 U.S. 144, 157 (1970); Perry, ALAB-443, supra, at 753; 10 CFR § 2.732.

However, where no evidence exists to support a claim asserted, it is appropriate to promptly dispose of a case without a formal hearing. The Commission has made clear that intervenors must show that a genuine issue exists prior to hearing, and if none is shown to exist, the Board may summarily dispose of the contentions on the basis of the pleadings. Prairie Island, CLI-73-12, supra at 242. This obligation of intervenors is reflected in 10 CFR § 2.749(b) which states therein:

> When a motion for summary disposition is made and supported as provided in this section, a party opposing the motion may not rest upon the mere allegations or denials of his answer; his answer by affidavits or as otherwise provided in this section must set forth specific facts showing that there is a genuine issue of fact. If no such answer is filed, the decision sought, if appropriate, shall be rendered.

As the Supreme Court has pointed out, Rule 56 does not permit plaintiffs to get to a jury on the basis of the allegations in the complaints coupled with the hope that something can be developed at trial in the way of evidence to support the allegations. First National Bank of Arizona v. Cities Service Co., 391 U.S. 253, 289-290 (1968). Additionally, as stated by another court, a plaintiff is not allowed to defeat a motion for summary disposition on the hope that on cross-examination the defendants will contradict their respective affidavits. This is purely speculative and to permit trial would nullify the purpose of Rule 56 which provides summary judgment as a means of

putting an end to useless and expensive litigation where no genuine issues exist. Orvis v. Brickman, 95 F.Supp. 605, 607 (1951) aff'd 196 F.2d 762 (D.C. Cir. 1952). Summary disposition provides a safeguard against expenditure of time and effort at hearing on any contention which is manifestly unworthy of exploration. Gulf States Utilities Co. (River Bend Station, Units 1 and 2) ALAB-183, 7 AEC 222, 228 (1974).

To defeat summary disposition, an opposing party must present material, substantial facts to show that an issue exists. Conclusions alone will not suffice. River Bend, LBP-75-10, supra at 248. Perry, ALAB-443, supra, at 754. If a contention is to remain litigable, there must be presented to the Board a sufficient factual basis to require reasonable minds to inquire further. Pennsylvania Power and Light Co. (Susquehanna Steam Electric Station, Units 1 and 2) ALAB-613, 12 NRC 317, 340 (1980). Further, if the statement of material facts required by 10 CFR § 2.749(a) is unopposed, the uncontroverted facts are deemed to be admitted. Pacific Gas and Electric Co. (Stanislaus Nuclear Project, Unit No. 1), LBP-77-45, 6 NRC 159, 163 (1977).

The Staff believes that even when the following affidavits and discussion concerning the contentions are viewed most favorably in support of the contention, that it is clear that no genuine issue of material fact exists to warrant litigation of the contentions, and that summary disposition should be granted as to all of the contentions subject to this motion on the basis of the pleadings. If the Board is unable to grant summary disposition of

each contention in its entirety, summary disposition should be granted on any part as to which there is no genuine issue of material fact.[3/]

B. Standards For Research Reactor Licenses

Because this proceeding is only the second time a research reactor license has been litigated under the Commission's procedures, and because no safety regulations have been promulgated by the Commission for research reactor design and operation, such as those in 10 CFR Part 50 for power reactors, the Staff believes it important to point out the safety concepts and standards previously delineated by the Appeal Board and affirmed on appeal by the federal courts, for application to research reactor licensing.

The first and only previous case litigating a research reactor operating license was that of the proposed Columbia University reactor.[4/] There the Appeal Board found that absence of regulations specifically formulated for the purpose of defining criteria for evaluating effects of accidents at research reactors was not an impediment to reaching a conclusion about risk to the public from an accident since the Commission has radiation protection standards in 10 CFR Part 20.[5/] The Appeal Board also concluded that no significant environmental impacts could occur from operation of the Columbia

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3/ 10 CFR § 2.749(a) authorizes a "decision by the presiding officer in that party's favor as to all or any part of the matters involved in the proceeding." Public Service Company of Oklahoma, et. al (Black Fox Station, Units 1 and 2), LBP-77-46, 6 NRC 167 (1977); Toledo Edison Company (Davis-Besse Nuclear Power Station), LBP-73-30, 6 AEC 691, 699 (1973).

4/ For the case history see: Trustees of Columbia University (Columbia Research Reactor), ALAB-3, 4 AEC 349 (1970); LBP Initial Decision, 4 AEC 594 (1971); ALAB-26, 4 AEC 647 (1971); ALAB-50, 4 AEC 849 (1972); Morningside Renewal Council, Inc. et al. v. U.S. Atomic Energy Commission, 482 F.2d 234 (2d Cir. 1973), cert. denied 417 U.S. 951 (1974).

5/ ALAB-50 at 854.

reactor and that no Environmental Impact Statement was required.[6] The Federal Court of Appeals reviewed the record of this decision and, pointing out Section 104 of the Atomic Energy Act[7] which directs the Commission to impose only a minimum amount of regulation (on a Class 104 licensee) as necessary to fulfill its statutory obligations and protect the public while permitting research and development,[8] the Court stated that

> Absence of general regulations and objective criteria regarding postulated accident situations, which the Licensing Board thought necessary before granting authorization to issue the license, presents no bar to the issuance of the license in this case since the Board's decision is amply supported by a full record.[9]

The Court also ruled that the threshold finding by the Appeal Board that the licensing of the Columbia reactor was not a major federal action significantly affecting the environment was supported by the record and that it was within the agency's authority to make the threshold determination.[10]

6/ Id., pp.864-69.

7/ Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2134c. Section 104c states:

> The Commission is authorized to issue licenses to persons applying therefor for utilization and production facilities useful in the conduct of research and development activities of the types specified in section 31 and which are not facilities of the type specified in subsection 104b. The Commission is directed to impose only such minimum amount of regulation of the licensee as the Commission finds will permit the Commission to fulfill its obligations under this Act to promote the common defense and security and to protect the health and safety of the public and will permit the conduct of widespread and diverse research and development.

8/ Morningside Renewal Council, op. cit. p.236-37.

9/ Id., p.239.

10/ Id., p.239.

It was with this precedent in mind, namely, a showing that the most severe credible accident will not create a risk to public health and safety, that the Staff commissioned the study of five postulated accidents by the Pacific Northwest Laboratory (Battelle) and Los Alamos National Laboratory, both of which were served as supporting documents and bases for the Staff's Safety Evaluation Report and Environmental Impact Assessment.[11/]

Therefore, to summarize the Staff's approach to the evaluation of research reactors, and that also used in addressing the issues raised in the contentions admitted to the proceeding, it should be noted that the Staff sought to demonstrate the inherent safety of Argonaut research reactors by showing that no adverse consequences will result from any of the seven accidents postulated and analyzed by the scientific laboratories and by the Staff.[12/] Having shown this, the Staff believes it is clear that none of the CBG contentions has a factual basis, and that the contentions subject to this motion should be dismissed. The Staff will address each contention individually in the following discussion, affidavits, and references.

C. The Contentions

Although each contention of the Intervenor is quite lengthy; the supporting documentation submitted with the original contentions is extensive; and

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11/ Analysis of Credible Accidents for Argonaut Reactors, NUREG/CR-2079, Pacific Northwest Laboratory (Battelle Memorial Institute); Fuel Temperatures in an Argonaut Reactor Core Following a Hypothetical Design Basis Accident, NUREG/CR-2198, Los Alamos National Laboratory. A verifying study of transient behavior of the Argonaut reactor was performed by Brookhaven National Laboratory.

12/ The Battelle study analyzes five postulated accidents; Los Alamos Lab, one, and the SER, one.

discovery has produced an enormous amount of material, the Staff believes it is very clear that no issues of fact have been presented by the Intervenor, but rather, the contentions rest on mistaken assertions and unfounded assumptions pertinent to power reactors but not valid for the simple design of a research reactor. Indeed, the Intervenor has provided materials in some instances, which contradict the allegations in the contentions.

The Board should take note of the original bases submitted by the Intervenor with the original contention as well as the description of supporting evidence provided by the Intervenor during discovery. These bases and "evidence" consist almost entirely of I&E reports, UCLA annual reports, and the UCLA application for license renewal. Most of the I&E reports cited by Intervenor predate the 1975 change in management at UCLA. Thus, the only evidence that the Intervenor could present at hearing consists of documents which have been a matter of record at NRC on the UCLA docket for several years. The Intervenor has no expert witness or other evidence to offer. (CBG response to Staff interrogatory A). The allegations made in the contentions consist entirely of the Intervenor's mischaracterization of events reported by I&E or UCLA so that minor operating or administrative problems at UCLA have been catapulted by Intervenor's exaggerations into matters of great significance. The affidavits of four inspectors in Region V (Walnut Creek, California) which address matters in Contentions III, IV, VII and IX soundly challenge and contradict Intervenor's insupportable interpretation of the UCLA operating history.

Thus, most of the contentions rest on facts which are known and agreed by all parties so that there is no dispute whatsoever about the facts referenced, but about the significance of the facts. Indeed, it can be

fairly stated that there is no issue of material fact underlying any contention admitted to this proceeding, since all allegations made by Intervenor in this case rest on issues of safety created by Intervenor's misinterpretation of the agreed facts or the Commission's regulations.

One other item of note in these contentions is that there are only a few issues raised by Intervenor but in several variations, creating several contentions which are a rewording of other contentions but which are substantially the same and rest on the same set of reports concerning UCLA operating history. Thus, the Staff affidavits are repetitive to a certain extent, to address repetitive issues.

In summary, the Staff will show that no real isssues of safety have been raised by the Intervenor; that the UCLA operating history on record at the Commission contains no facts which give cause for concern for public health and safety; that the attempt by Intervenor to apply large, complex power reactor concepts and principles to the small, simple design of an Argonaut research reactor is entirely invalid; that the several analyses of postulated accidents performed recently by two of the Commission's consultant scientific laboratories, and by the Staff, to assure the Commission of the inherent safety of the Argonaut which has operated in the midst of populated university campuses for many years, show conclusively that no risk to public health and safety exists in the continued operation of the UCLA reactor, nor has there been such a risk in the past twenty years of operation.

The Staff will reference the following documents and pleadings on the record in the proceeding to show that no contention admitted to this proceeding rests on any issue of material fact.

1. The UCLA Application for Renewal of License R-71, February 28, 1980 (Application), and amendments of June 23, 1982.

2. CBG Supplemental Contentions, August 25, 1980 (Supplemental Contentions) (The Staff has numbered this document sequentially from 1-137 for ease of reference).

3. Answers of CBG to Staff's First Set of Interrogatories, May 20, 1981 (CBG Responses).

4. Safety Evaluation Report for Renewal of the UCLA research reactor license, June 1981 (SER).

5. Environmental Impact Assessment for Renewal of the UCLA research reactor license, June 1981 (EIA).

6. Analysis of Credible Accidents for Argonaut Reactors, NUREG/CR-2079, April 1981 (Battelle Study).

7. Summary of Computer Model and Selected Results from Argonaut Design Basis Accident Evaluation, NUREG/CR-2198 C.E. Cort, Los Alamos National Laboratory, February 1981 (LANL Study).

CONTENTION I[1/]

This contention's allegation that undefined "minimum standards" for nuclear license applications were not met by the UCLA application does not

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1/ I. The application, together with its supporting appendices, is deficient in failing to meet the minimum standards for such applications. Specifically:

1. The application reference to experimental vibration of the reactor is misleading.

2. The application submitted by UCLA was not "original" in all respects as shown by

a. its submission of a 1980 Safety Analysis Report (SAR) which repeats virtually verbatim its 1960 Hazards Analysis, and

b. its submission of an environmental impact appraisal which repeats virtually verbatim the language of a 1974 AEC memorandum on "Environmental Considerations Regarding the Licensing of Research Reactors and Critical Facilities."

c. its inclusion by reference of "Analysis of Credible Accidents for Argonaut Reactors" by Hawley, et. al, and "Fuel Temperatures in an Argonaut Recator Core Following a Hypothetical Design Basis Accident (DBA)" by Cort.

3. Material and inaccurate statements have been submitted in applications:

a. "The reactor and its supporting laboratories will be used for the education of senior undergraduate and graduate students in nuclear engineering and related sciences. In addition to formal courses and demonstrations, the reactor will be used to support research at the M.S. and Ph.D levels." page 5, 2/80 application as amended 6/82.

b. "No structural weaknesses (earthquake vulnerability) have ever been identified." page 7, 2/80 application as amended 6/82.

c. "No attempt has been made to alter the content and provisions of the technical specifications other than the four changes noted in the forward to the technical specifications." page V/1, (2/80 application).

This statement is inaccurate because

(i) the excess reactivity limits have been changed from % Δ k/k to $;

(ii) the definition of 'annual' for the purpose of instrument calibration requirements has been changed from 12 months;

(iii) the requirement to do heat balance instrumentation calibrations has been removed;

(iv) the requirement that ALARA be met has been removed; and

(v) the specification regarding exhaust stack height, flow rate out of the exhaust stack, and access restrictions to the roof area have been altered.

(FOOTNOTE CONTINUED ON NEXT PAGE)

raise a litigable issue since only the Nuclear Regulatory Commission possesses legal authority to set these standards[2/] which are set out in the Commission's regulations in 10 CFR § 50.30, 50.33, and 50.34(b). These requirements were satisfied by the UCLA application as demonstrated by the affidavit of the Staff project manager for the UCLA reactor, Harold Bernard (attached) and the Commission's Federal Register notice published April 25, 1980 (45 Fed. Reg. 28028). The contention does not allege that any of the Commission's standards were not met. The NRC determination of the sufficiency of the application is of public record since Federal Register notices concerning consideration of applications are only issued after the application is officially "docketed," or accepted as sufficient for review. This is standard agency practice of which the Board may take official notice.

The specific matters alleged by this contention to be "deficiencies" in the application, i.e., (1) that a reference to an experimental vibration test is misleading, (2) the application is not original and that (3) several statements in the application are materially inaccurate,

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1/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

d. "No deep wells have been drilled on the campus of UCLA or in the vicinity of the campus. page III/3-1, 2/80 application amended 6/82.

e. "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." page II/3-1, 2/80 application amended 6/82.

f. "There are no suitable or more economical alternatives which can accomplish both the educational and the research objectives of the facility." page II/5-1, 2/80 application as amended 6/82.

g. "SPERT and BORAX tests showed that plate type fuel elements survived step radioactivity insertions of $3.54." page V/3-6, 2/80 application and parallel statement p. V/3-7 of 6/82 amendment.

2/ 42 USC §§ 2131, 2134, 2232 and 5841.

are arbitrary definitions by the Intervenor which do not withstand examination.

Subpart 1 of the contention states that the application reference to an experimental vibration test at the UCLA reactor is misleading. The Board admitted this subpart with the following comment:

> 1.1 Both UCLA and Staff opposed the admission on the basis that the application cited the article relating to the vibration test and therefore did not omit essential information. It appears to us that the article was cited in support of the application, which may or may not be the case. We have determined that it is appropriate to inquire into the matter. The contention is admitted as modified:
>
> > "The Application reference to experimental vibration of the reactor is misleading." Tr.98.3/

The original wording of this subpart was as follows:

> The application omits essential information with regard to experimental vibration of the reactor. (Stipulation, December 1, 1980), Attachment B, p.1)).

The vibration test reference in the application is as follows: (p.II/3-1).

3.0 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. The UCLA Reactor has been subjected to experimental vibration. The results were reported by C.B. Smith at the Winter Meeting of the American Nuclear Society, November 1968, in a paper titled "Vibration Testing and Earthquake Response of Nuclear Reactors".

3/ Order Subsequent to Prehearing Conference, March 20, 1981 at 2-3.

It is entirely unclear why the Intervenor originally asserted that essential information was omitted nor is it any clearer why the Board rewrote this subsection to describe the test reference as "misleading" with the explanation that it "[a]ppear[ed] to the Board that the article was cited in support of the application..." Even though the test reference is cited in support of the application, a reference to the full report of the test, reported at a public meeting in 1968 discussed in a letter dated May 13, 1980 from UCLA (R.R. O'Neil) to NRC (R. Reid) and known to the Staff since 1968 could not be "misleading." (See p.120 of Supplemental Contentions referencing AEC Report 68-2).

In any event, the Intervenor's Supplemental Contentions (August 25, 1980) at page one, fully clarifies the information in the test report by the following quotation from page 24 of the report. (The first and twenty-fourth pages of the test report are included in the Intervenor's Supplemental Contentions at pp.9-10).

> About six months after the vibration experiment, routine tests indicated that one of the control blade insertion times had increased. A few months later safety blade no. 1 stuck in the "out" position during a routine prestart checkout of the reactor control system.
>
> When the reactor was dismantled, we discovered that lead shielding bricks had been displaced upward, causing the shaft to bend.
>
> "Vibration Testing".

It should be apparent that the results of the vibration tests cited by the Intervenor could indeed be used legitimately in support of the application since the only adverse results of the test were that <u>six months</u> after the test one safety blade stuck due to displacement of shielding bricks. In sum, the Staff believes this subpart is a misnomer and that the application

reference does not submit or omit any information adverse to a safety finding nor does it mislead by simply referencing a test.

In addition, the test and its results have been known to the Staff since 1968 (Affidavit of H. Bernard, p.2) so that reference to the test could not mislead the Staff for whose review the application is submitted.

Subpart 1 should be dismissed because there is no factual issue that is litigable in the allegation as demonstrated by the Intervenor's August 25, 1980 Supplemental Contentions, which demonstrates that the paper reporting the results of the vibration test is in the public domain and supports the application.

Subpart 2 alleges that the application is "defective" because the Safety Hazards Analysis Report (HAR) submitted is a "virtually verbatim" repetition of the 1960 Hazards Analysis[4/] and the "environmental impact appraisal" in the application quotes from a 1974 AEC generic environmental report on research reactors, and because the application references the two (Battelle and LANL) generic studies of Argonauts by consulting laboratories.

There is no factual or legal merit to either of these allegations. The Commission sets the standards for information required for applications. There is no requirement for "original" information for a license renewal application (Affidavit of H. Bernard, p.2). Previously submitted information which has not changed is acceptable to support the application. All parties would agree that the referenced material is not "original". The only point of debate is whether it need be. The Commission officially accepted the application as adequate to meet the regulations and docketed it for review in April 1980. This subpart must be dismissed.

4/ The 1960 HAR was withdrawn and replaced by amendment filed 6/23/82, thus it is not now part of the pending application.

Subsection 3 asserts that there are seven "material and inaccurate statements" in the application, but the more appropriate description by Intervenor should have been "statements which Intervenor wishes to contest" which Intervenor does indeed raise in other contentions. In Subpart 3 of this contention the original concept of a "deficient" application is essentially changed to a matter of issues unrelated to the adequacy of the application. The "inaccurate" statement quoted in 3.a. concerns use of the reactor for education and research. This is the precise issue raised in Contention II which alleges that the reactor is used more for commercial than educational purposes and that a Class 103 license should issue. Subpart 3.a. should be dismissed as failing to raise an issue since it could not be a "defect" in an application to describe the use of the reactor. The Intervenor's assertion that this is an "inaccurate" statement rests on the basis that the application at p.III/1-5 shows "only 34 hours" spent on instruction (Supplemental Contentions, pp.3-4).[5/] Clearly, the Intervenor wishes to contest the amount of time spent in education as it does in Contention II, but shows by its own reference that the statement is not inaccurate (i.e., the reactor is indeed used for education and research).

The next "inaccurate" statement quoted from the application (in Subpart 3.b.) is that "no structural weaknesses (earthquake vulnerability) have ever been identified." The basis for alleging the inaccuracy is a quotation from the UCLA 1976 Annual Report that the 1971 earthquake gave rise to minor problems that worsened with time and required a major maintenance

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5/ The June 23, 1982 application amendment states that the reactor is used for 3328 student hours of instruction for 8 engineering and physics courses. (Application, p. III/1-6)

effort in 1972. Intervenor also references the vibration test, above. (Supplemental Contentions, p.4).

Again, Intervenor has by its references, demonstrated the accuracy, not the inaccuracy of the application statement. A "minor problem" causing a major maintenance effort a year later cannot reasonably be construed as structural vulnerability to earthquakes, but rather, evidence of structural safety during an earthquake. The reference to the vibration test is also further evidence of structural integrity as discussed above. Subparts 3.a. and 3.b. must be dismissed because no issue is raised. Intervenor's own documentary submissions show that the application's statements quoted in Subparts 3.a and b. are accurate.

Subpart 3.c. lists several alleged changes in the technical specifications contained in the application. As demonstrated by the Affidavit of H. Bernard (p.3) none of the matters indicated are significant and some are not even changes. Additionally, the presence or absence of deep wells on or near UCLA is not a material fact since only low level effluents are released routinely (SER § 11.1-2) and, even a serious accident would not result in significant radioactive releases to ground water (SER § 14).

The SER analysis of the consequences of a severe earthquake near UCLA (Sec. 14) as well as the Battelle and LANL studies likewise show that the application's statements referenced in 3.e. and g. are accurate, and based on scientific evidence.

Subpart 3.f. alleges that the statement in the application, that there are no suitable alternatives for the functions performed by operation of the UCLA reactor, is a material and inaccurate statement, whereas, although undoubtedly material, it is not inaccurate, as shown by the SER § 10 and EIA

(pp.5&6). It should be self-evident that a training reactor is necessary to teach nuclear engineering and nuclear physics.

In sum, as shown by reference to the Intervenor's documents submitted as bases for this contention; by the Affidavit of Harold Bernard; and by reference to the Safety Evaluation Report, Environmental Impact Assessment, and the pertinent statutes and regulations, the Staff has demonstrated that the application was and is sufficient and materially accurate for review and that there is no issue of material fact requiring litigation of any part of Contention I. Therefore the Staff submits that Contention I must be summarily dismissed in its entirety as a matter of law.

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)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION I

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to this affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention I, which I have read in its entirety.

4. Instructions were sent to UCLA by NRC Staff as to information required in a license renewal application and these instructions were followed.

5. After an initial review of the application, I found it sufficiently complete for review and sent a notice to the Federal Register in April 1980 that the Commission was considering the renewal of the license.

6. I have reviewed all the information submitted by UCLA in its license renewal application and have requested and received NRC technical reviews of the application for inclusion in the Safety Evaluation Report, part of which I have personally written.

7. I have directed NRC consultants in specific studies of the Argonaut reactor design and operation for Staff use.

8. It is my opinion as a project manager in the NRC Division of Licensing that sufficient information was provided by UCLA in its application so that the Staff could properly review and determine the safety and environmental impacts of continued operation of the reactor for twenty years.

9. My findings and reasonings are as follows:

> The fundamental requirements that must be satisfied by the application for a research reactor license renewal are the requirements of 10 CFR §§ 50.30, 50.33, and 50.34, as applicable, so that adequate information is obtained to enable the reviewer to determine from the application and the information on record in the agency the key safety features of the reactor and environmental impacts which must be analyzed.

10. The original license application submitted by UCLA contained a great deal of information which is part of the docket for the UCLA research reactor, as are the annual reports submitted by the University and the reports by the NRC Office of Inspection and Enforcement.

11. For this reason, the information necessary for a license renewal need not be as extensive as that for an initial license and need not nor could be entirely original.

12. I and other members of the Staff have reviewed the entire contents of the UCLA application for renewal of License R-71 and have found no misleading or materially inaccurate statements therein.

13. The Staff has known of the 1968 vibration test referenced on p. II/3-1 of the application and the results of the test since its occurrence. The resultant problem with the control blade and the repair done was discussed in I&E Report 50-142/68-2.

14. In my opinion the vibration test demonstrates structural integrity of the reactor since only minor damage was incurred. The damage was repaired and has withstood the 1971 and 1981 earthquakes in Los Angeles.

15. The references to technical specification changes in Contention I.3.c. are not significant matters since they refer to (i) a change in calculation method which does not change the limits of reactivity; (ii) it is common industry and Staff practice to define "annual" as more than twelve months (ANSI/ANS 15.18 standard); (iii) the heat balance instrumentation is not significant to safe operation; (iv) ALARA is a regulation, not a technical specification; and (v) Amendment 10 to

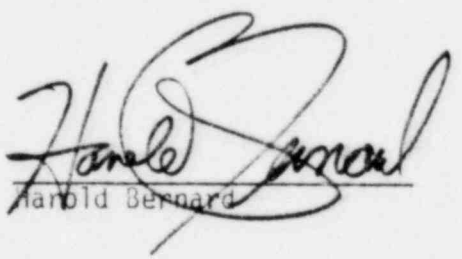
the UCLA license modified the stack height and flow rate, while the Boelter Hall roof is a restricted area by the proposed technical specification 3.8.3.B issued with the Safety Evaluation Report.

16. Whether or not deep wells have been drilled on the UCLA Campus or vicinity is not significant since no high level radioactive releases to ground water would occur from normal or accident conditions.

17. Statements referenced in Contention I.3.e.f.g. are accurate as shown in the Staff's Safety Evaluation Report and references.

18. In summary, I do hereby state that the February 23, 1980 application for renewal of the UCLA research reactor license and supporting appendices was and is sufficient to meet Commission standards and to enable the Staff to properly review all significant matters of safety and environmental impacts connected with continued operation of the reactor.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.



Harold Bernard

Subscribed and sworn to before me
this _____ day of _____, 1981

_____
Notary Public

My Commission expires:

HAROLD BERNARD

PROFESSIONAL QUALIFICATIONS

My name is Harold Bernard. I am a Project Manager in the Standardization & Special Projects Branch in the Division of Licensing, in the Nuclear Regulatory Commission, assigned to review those functions of non-power nuclear research and testing plants that are associated with the review and issuance of construction and operating licenses and amendments to assure the safe operation of this category of nuclear reactors. I have been employed by the Nuclear Regulatory Commission since February 1980.

As project manager, I was responsible for planning the evaluation of the UCLA license renewal application; for providing a technical evaluation of this application; for reviewing the evaluations of other technical personnel; for producing the Safety Evaluation Report (SER), the Technical Specifications, and the environmental appraisal.

I received a Bachelor of Civil Engineering Degree from the Polytechnic Institute of Brooklyn [now New York Polytechnic Institute] in 1949 and in 1951 completed all technical requirements for a Master of Science in Sanitary Engineering at the University of Illinois. I have completed many short courses and additional graduate courses in various aspects of nuclear engineering and in sanitary/environmental engineering at UCLA, George Washington University, the National Institute of Health and the University of Michigan. I am a registered Professional Engineer in the State of Maryland.

From 1951 to 1955 I was employed as a Sanitary Engineer by a consulting firm in Los Angeles, California.

I was employed by Atomics International from 1955 to 1960 as a Process Engineer concerned with the design of liquid, gaseous, and solid waste management systems. One year was spent as a shift supervisor at the 10 MW Organic Moderated Research Experimental Reactor located at the National Reactor Test Site in Idaho.

From 1960 to 1966 I was a Senior Sanitary Engineer with the Atomic Energy Commission with the responsibility for the development of operational radioactive waste management concepts for liquid, gaseous, aerosol, and solid, low, intermediate and high level wastes.

From 1966 to 1972 I was employed by the Environmental Protection Agency in the Office of Research and Development, as a Branch Chief with the responsibility for the development and implementation of waste management concepts in the areas of pollution control from agribusiness activities and acute discharges of oil and hazardous materials into terrestrial, river, atmosphere and marine systems.

CONTENTION II[1/]

This contention alleges that UCLA should be required to apply for a commercial (Class 103) license pursuant to 10 CFR § 50.22 rather than a research (Class 104) license because reactor income from commercial sources is more than fifty percent of the income for the UCLA nuclear energy laboratory. This assertion misconstrues the Commission's regulation and thus has no basis for litigation.

10 CFR § 50.22: "Class 103 licenses for commercial and industrial facilities: states in pertinent part:

> That in the case of a production or utilization facility which is useful in the conduct of research and development activities of the types specified in Section 31 of the Act, such facility is deemed to be for industrial or commercial purposes if the facility is to be used so that more than 50 percent of the annual cost of owning and operating the facility is devoted to the production of materials, products, or energy for sale or commercial distribution, or to the sale of services, other than research and development or education or training. (Emphasis added)

Intervenor has not alleged that more than fifty percent of the cost of owning and operating the facility is devoted to commercial purposes, but, rather, has calculated the income sources.

1/ II. The Applicant has applied for the wrong class of license. Applicant has applied for a Class 104 license despite the fact that in the past, more than fifty percent of reactor funding and more than fifty percent of the hours of reactor usage have been devoted to the sale of services, rather than research or education. Given this history, and without any indication that Applicant intends to change reactor usage, Applicant under 10 CFR § 50.21(b) and 10 CFR § 50.22 should have applied for a Class 103 license. Specifically:

Applicant should apply for a Class 103 license because

a. Applicant's financial statements indicate that more than half of the reactor funding comes from sources other than the UCLA School of Engineering and Applied Sciences, and

b. More than half of the reactor operating time is spent on commercial, non-educational projects.

As shown by the attached affidavit of Jim C. Petersen, the University's cost accounting of the reactor facility indicates that less than two percent of the total annual reactor costs from 1971-1981 have been incurred due to non-academic activities. (Petersen, p.4).

The Staff submits that no material issue of fact underlies Contention II since Intervenor has shown no basis for alleging that more than fifty percent of the costs of owning and operating the UCLA reactor are devoted to commercial activities, and the small (2%) amount of non-academic costs incurred by UCLA are clearly not sufficient to raise a question as to whether or not a commercial license should be issued. For these reasons the Staff requests summary disposition of Contention II.

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)
(UCLA Research Reactor)	)	

AFFIDAVIT OF JIM C. PETERSEN
CONCERNING INTERVENOR CBG CONTENTION II

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Jim C. Petersen having first been duly sworn, do hereby depose and state as follows:

1. I am employed as Senior Financial Analyst by the Office of State Programs, U. S. Nuclear Regulatory Commission. My primary responsibility is the performance of the financial qualifications reviews of applicants during the nuclear licensing process. This review includes an analysis of estimated construction costs in construction permit proceedings and operating expenses in operating license matters. The financial review also encompasses the projected financing methods by which the required funds will be obtained. In addition, I review the climate and trends of state utility commissions. In this regard, I have prepared financial testimony for inclusion in the Staff's Safety Evaluation Reports and for presentation in

Atomic Safety and Licensing Board proceedings. I have testified as a Staff witness at a number of ASLB hearings. A statement of my professional qualifications is attached.

2. The purpose of my affidavit is to address CBG Contention II admitted to this proceeding.

3. The Commission's criteria for determining the appropriate class of license applicable to production and utilization facilities are stated in 10 CFR 50.21 and 50.22. Section 50.21 refers to Class 104 licenses for medical therapy and research and development facilities. Section 50.22 refers to Class 103 licenses for commercial and industrial facilities. Section 50.22 states in pertinent part that:

> "In the case of a production or utilization facility which is useful in the conduct of research and development activities of the types specified in Section 31 of the Act, such facility is deemed to be for industrial or commercial purposes if the facility is to be used so that more than 50 percent of the annual cost of owning and operating the facility is devoted to the production of materials, products, or energy for sale or commerical distribution, or to the sale of services, other than research and development or education or training."

In accordance with the above-stated provisions of 10 CFR 50.22, the proper classification of annual reactor costs (to either (1) "production of materials, products, or energy for sale or to the sale of services," or (2) "research and development or education and training") is the factor that determines the appropriate class of license. Thus,

classification of more than 50 percent of annual costs to one of these two categories indicates that the applicable class of license is either (1) class 103 - commercial and industrial or (2) class 104 - medical therapy and research and development, respectively. The purpose of this affidavit is to review the accounting practices used by the applicant to determine if these were properly applied in classifying the annual costs of owning and operating the reactor between the two categories and thus, whether or not the applicant has applied for the proper class of license.

4. The intervenor contends that the applicant's facility should be licensed under 10 CFR 50.22, or a class 103 license (commercial and industrial facility) because: "more than fifty percent of reactor funding and more than fifty percent of the hours of reactor usage have been devoted to the sale of services, rather than research or education," (Intervenor Contention II). It is important to note here that the criterion set down in the regulation is one of cost allocation rather than hours of usage. Thus, <u>costs</u> actually attributable to the performance of a commercial activity or a research and development activity are classified with that activity and in sum total determine the class of license.

5. The applicant maintains that the vast majority of the costs of owning and operating the reactor are attributable to educational and research purposes of the University. It also maintains that the fixed costs of operation (staffing and maintenance) are incurred

regardless of whether or not the facility provides services to non-academic (commercial) users. To support these assertions the University filed reactor cost information showing both non-academic and academic cost allocations. That filing was dated January 25, 1982. For the most recent budget year available (fiscal year 1980-81), total direct reactor costs were $224,000. Of that total less than $3000 is attributable to non-academic (commercial) uses of the facility.

Costs attributable to non-academic (commercial) uses are those that would be avoided if such non-academic uses of the reactor had not occurred. This is in accordance with accepted cost accounting principles which generally state that an incurred cost should be identified as to the function or purpose for which it is incurred or expended. UCLA's stated costing procedures are evidently in accord with such accepted principles. A review of the submitted reactor cost statements for the years 1971 through 1981 indicates that non-academic (commercial) costs are less than two percent of total annual reactor costs, well below the 50 percent criterion specified in the pertinent NRC regulation. The vast majority of total reactor costs has been expended toward educational purposes.

6. In accordance with the above summary and my review of the application and the supporting cost accounting statements, I have concluded

that well in excess of 50 percent of UCLA's total annual cost of owning and operating the reactor is properly classified as being attributable to research and development or education and training. Accordingly, UCLA has appropriately applied for a class 104 license under the provisions of 10 CFR 50.21.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Jim C. Petersen

Subscribed and sworn to before me
this 25th day March, 1982.

Notary Public

My Commission expires: July 1, 1982

JIM C. PETERSEN

PROFESSIONAL QUALIFICATIONS

OFFICE OF STATE PROGRAMS

I am the Senior Financial Analyst in the Office of State Programs, U.S. Nuclear Regulatory Commission. I am responsible for the review and evaluation of the financial qualifications of nuclear facility license applicants to pursue proposed activities under a license, primarily the construction and operation of nuclear power plants. In this regard, I have prepared financial qualifications analyses for inclusion in the Staff's Safety Evaluations and for presentation as evidence on the record of the Atomic Safety and Licensing Board's safety hearings. I have served as a Staff witness before the Atomic Safety and Licensing Board in a number of proceedings. My work also involves keeping abreast of developments in the money and capital markets and in the electric utility industry.

I received a Bachelor of Science in Business Administration degree (awarded cum laude) with a major in Accounting from the University of Denver in 1968. I have continued my formal education through college and university courses in finance, math, economics and computer science and through several intensive short courses. I am a member of Beta Gamma Sigma, the national business administration honorary, and Beta Alpha Psi, the national accounting honorary. The latter organization presented me with its award for outstanding service.

From 1968 through 1973, I was employed in a number of assignments on the staff of the Controller of the Atomic Energy Commission. These assignments included reviewing, designing and implementing accounting systems and procedures for AEC offices and AEC contractors. I also assisted in the financial review of nuclear facility license applicants during the period when that function was performed by independent staff members of the AEC Office of the Controller. That function was subsequently transferred in its entirety to the NRC. In January of 1974, I joined the regulatory staff and assumed responsibilities in the financial qualifications review of nuclear facility license applicants. I have worked in NRC financial analysis since that time, except for a one-year assignment at the U.S. Department of Energy where I worked on the financing of emerging energy technologies.

CONTENTION III[1/]

The original bases cited by the Intervenor in its Supplemental Contentions to support this contention are, for the most part, references to reports from the Office of Inspection and Enforcement issued prior to the first license renewal in 1971. All I&E reports cited by the Intervenor date before appointment of a new NEL director in 1975. Intervenor admits in CBG responses 24 and 25 to Staff interrogatories that it cannot present any evidence of management failures since 1975 except I&E report 80-02 concerning two technical specification infractions identified during a February 1980 inspection. Intervenor alleges that UCLA allowed unlicensed visitors to operate the reactor controls but implies that they may have been authorized. (See CBG response to Staff interrogatory 26).

1/ Applicant has failed to demonstrate adequate managerial and administrative controls in the application, as required by 10 CFR § 50.34(b)(6)(ii), and further, has demonstrated throughout its operating history grossly inadequate controls. These inadequacies make it impossible to find that Applicant's managerial and administrative controls are adequate to responsibly protect the public health and safety. Specifically:

1. Applicant failed to provide the information required in 10 CFR § 50.34(b)(6)(ii).
2. Applicant failed to get prior approval from the Reactor Use Committee or the Reactor Director for changes in reactor systems and for non-standard experiments.
3. Applicant failed to get prior Commission approval for facility changes.
4. The Lab Director and/or Assistant Director were absent for extensive periods of time and provided inadequate supervision.
5. Unlicensed visitors to the reactor facility were invited to operate the reactor controls in violation of 10 CFR §§ 50.54j, k, l; 55.2; 55.3a and b; 55.d and f; and 55.9a and b.
6. Applicant kept inadequate records and lost a maintenance log, and
7. Applicant failed to hold administrative meetings and conduct reviews required by the Technical Specifications.

Although Intervenor states that the Applicant has not provided the information required by 10 C.F.R. § 50.34(6)(ii) regarding managerial and administrative controls to be used to assure safe operation, the proposed technical specifications § 6.0 (Administrative Controls) contains sufficient information regarding this subject so that it cannot be considered an omission. Additionally, this facility has a twenty-year record of administrative controls documented by inspection reports.

Four NRC inspectors from the Commission's Region V Office of Inspection and Enforcement have provided affidavits in support of Staff's motion for summary disposition of Contentions III, IV, VII and IX. In some respects these contentions are repetitive, in that they all point to the manner of operation of the UCLA reactor and because the bases for all the contentions rest on past I&E reports. Therefore, the affidavits of the four inspectors provided for the four contentions cross-reference other inspectors' affidavits due to the differing assignments and responsibilties within the Region V Office.

The attached affidavit of one NRC inspector, Mr. Tolbert Young, Jr. attests to his recent personal inspection and review of the UCLA records and observation of the UCLA staff and his opinion that the management and administrative controls at the UCLA facility are adequate to insure public health and safety. The affidavit of Allen D. Johnson attests to his personal knowledge of the manner in which UCLA has allowed visitors to operate the reactor controls as specifically authorized by 10 CFR 55.4(d) and that his review of inspection reports for UCLA from December 1975 - June 1981 formed his opinion that the UCLA management and administrative controls are adequate to assure safe operation (Johnson affidavit attached to Contention IV, p.2, paragraph 4). (See also affidavits of inspectors Phillip Morrill and Frank A. Wenslawski

attached to discussions of Contentions VII and IX who further show their knowledge of the management controls of the UCLA facility.)

Inspector Phillip Morrill attests that the subject of the February, 1980 inspection report (80-02) referenced by the Intervenor was not of safety significance (Morrill affidavit attached to discussion of Contention VII, p.2, paragraph 6.) Mr. Morrill further notes that his review of the UCLA annual reports, I&E reports, and UCLA responses to notices of violation since 1975 as well as his personal inspections of the facility have formed his opinion that the UCLA reactor personnel have safely operated the facility (Morrill, pp. 1-2).

Inspector Allen D. Johnson points out that only three items of noncompliance have been identified by the Office of Inspection and Enforcement since December 1975 and that these items were administrative technicalities without safety significance. (Johnson affidavit attached to Contention IV, para. 3, pp. 1-2).

It should be noted by the Board that all I&E notices of violation require a response within twenty days from licensees explaining the manner of correcting the violation noted in the inspection report, so that a listing of infractions and deficiencies described in inspection reports is only part of the inspection record of a licensee. Of equal importance is the licensee's manner of responding and correcting the violations. In the case of UCLA, the Acting Director of Region V of OIE attests that the corrective actions of UCLA in response to notices of violations since 1975 have been sufficient to preclude recurrence of the violations (Johnson, p.1, para. 3).

Therefore, since Intervenor can present no evidence to support its allegation of inadequate managerial and administrative controls other than I&E reports

which predate the management of the current NEL director (except for one February 1980 report which is not of safety significance,)[2/] and because four inspectors from Region V of the Commission's Office of Inspection and Enforcement attest that the inspection history and their personal observations of the UCLA facility since 1975 have shown only a few minor technical violations of no safety significance, the Staff submits that there is no issue of material fact which can be litigated concerning Contention III and that it must be dismissed as a matter of law.

2/ The most recent inspection (April 5-9, 1982) report and licensee response is attached.

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	)	(Proposed Renewal of Facility License)
	)	
(UCLA Research Reactor)	)	

AFFIDAVIT OF TOLBERT YOUNG JR.

STATE OF CALIFORNIA)
COUNTY OF CONTRA COSTA) SS

I, Tolbert Young Jr., being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Inspection and Enforcement, Region V, Walnut Creek, California. My professional qualifications are attached.

2. I, along with Mr. Phillip Morrill, performed a routine inspection at the UCLA facility on June 24-26, 1981. The inspection covered the period from March, 1980 through June 1981. The inspection included an examination of maintenance records, calibration records, log books, radiation use committee minutes, procedures, records of experiments and the requalification training program records. We found no violations of the technical specifications, regulations or license conditions during the inspection.

3. I have read contention III admitted by the Atomic Safety and Licensing Board. Contrary to the contention, it is my professional opinion, based on my observations during my recent inspection of the facility, that the applicant's managerial and administrative controls are adequate to insure the public health and safety. Furthermore I am of the opinion that the personnel responsible for the operation of the reactor facility are qualified and conducted licensed activities in a safe and prudent manner during the period of March 30, 1980 through June 26, 1981.

4. I have read the Declarations of Allen D. Johnson, Frank Wenslawski and Phillip Morrill submitted in these proceeding and concur with the opinions and conclusions stated in each of the declarations.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Tolbert Young Jr.

Subscribed and sworn to before me
this 14 day of July, 1981

OFFICIAL SEAL
CAROL McDONALD
NOTARY PUBLIC - CALIFORNIA
CONTRA COSTA COUNTY
My Comm. Expires May 11, 1984

Carol McDonald
Notary Public

My Commission expires: May 11, 1984

Tolbert Young, Jr.
Professional Qualifications

Region V - Walnut Creek, California
Office of Inspection and Enforcement

My name is Tolbert Young, Jr. I am a Reactor Inspector with the Office of Inspection and Enforcement, assigned to the Walnut Creek, California Regional office.

I have a Master of Science Degree in Teaching in Mathematics. I received a B.A. in Mathematics and Physical Sciences from George Washington University in 1966 and my Masters from American University in 1968 - both schools are located in Washington, D.C.

I have a Professional Engineer certification in Nuclear Engineering from the State of California.

I served 20 years in the U.S. Army, retiring in 1971.

In 1961, I attended the U.S. Army Nuclear Power Plant Operators' Course. For the next ten years, I served in different capacities throughout the Army's Nuclear Power Program, qualifying as Equipment Operator, Control Room Operator, Shift Supervisor and Plant Superintendent. In 1966, I was appointed to the Training Division of that program and served in progressively more responsible positions until 1969 when I was appointed as Chief Instructor of that Division. In my capacity as Chief Instructor, I was responsible for the training of students and operators in all phases of nuclear power plant operations and maintenance.

In June 1971, I joined the then Atomic Energy Commission as a Reactor Inspector in the Region I, Newark, New Jersey Office. Since that time, I have been the principal inspector for over 15 research, test and power reactor facilities. From August 1972 to March 1974, I was assigned as principal inspector for the Vermont Yankee, Pilgrim 1 and Millstone 1 facilities, all Boiling Water Reactors (BWR). In June 1974, I was assigned as principal inspector for Diablo Canyon and was appointed resident inspector there in August 1978. In March 1981, I was reassigned to the regional office and I am now the principal inspector for San Onofre 2 and 3.

I have received the following special training:

1.	Fundamentals of BWR Plant Operations	1972
2.	BWR Technology	1973
3.	Pressurized Water Power (PWR) Reactor Facilities	1974
4.	PWR Refresher Training	1975
5.	PWR Simulator Training	1976
6.	BWR Facilities	1976

CONTENTION IV[1/]

Intervenor essentially alleges that because of the notices of violations in six inspection reports covering the years 1969 - 1980 (referenced in the Supplemental Contentions pp. 40-41 and listed in CBG response 27 to Staff's interrogatory) only two of which postdate the change in NEL director, that the Board cannot reach the judgment that there is reasonable assurance that the reactor will be operated without endangering public health and safety for the term of the proposed license renewal. Intervenor has no other evidence to offer. (CBG response 27).

Again, the Intervenor fails to mention the UCLA (required) responses to the notices of violation referenced.

As shown by the attached affidavit of the Acting Director of Region V of the Commission's Office of Inspection and Enforcement, Allen D. Johnson, nothing in the enforcement history of the UCLA facility since 1975 indicates a pattern of non-compliance or an indication that operation of the UCLA facility would create risk to the public health and safety. On the contrary, as explained by Director Johnson, a review of all inspection reports since December 1975 shows that only three items of administrative technicalities were reported and these were without safety significance (Johnson at 2). In addition to the affidavit of Mr. Johnson, the affidavits of Inspectors Young,

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1/ IV. Applicant has been consistently cited for violations of NRC regulations as well as violations of the provisions of its own Technical Specifications. This consistent pattern of regulatory non-compliance and the lack of assurances that the pattern will not continue in the future indcates that the Applicant cannot adequately demonstrate that future operation of the facility will comply satisfactorily with the regulations to protect the public health and safety.

Morrill and Wenslawski (attached to discussion of Contentions III, VII and IX respectively) further attest to the safe operating history shown in the I&E inspection records.

Therefore, as shown by the above discussion of the CBG Supplemental Contention bases referenced in support of Contention IV, and responses to Staff interrogatory 27, there is no issue of material fact to be litigated concerning Contention IV since the sole "facts" raised in support of the contention are the I&E reports which cite only minor matters and do not in any way indicate that continued operation of the UCLA facility would threaten public health and safety, as attested by four I&E inspectors who have personally visited UCLA and/or reviewed the entire enforcement record of the facility since 1975. In sum, this contention rests only on a mischaracterization of the UCLA enforcement record by the Intervenor. There is no issue of fact at all underlying this contention since no one challenges the contents of the I&E reports. The contention of the Intervenor mischaracterizes minor enforcement actions as major ones. The Staff submits Contention IV must be dismissed as a matter of law since it is quite clear that no issue of material fact concerning the contention exists, and that Intervenor's description of the UCLA inspection history is insupportable.

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AFFIDAVIT OF ALLEN D. JOHNSON

STATE OF CALIFORNIA)
COUNTY OF CONTRA COSTA) SS

I, Allen D. Johnson, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Inspection and Enforcement, Region V. My professional qualifications are attached hereto.

2. As Acting Director of Enforcement and Investigations, NRC, Region V, and for the past five years as Enforcement Coordinator, I have had the responsibility to review enforcement actions initiated in the Regional Office to assure said actions were consistent with NRC enforcement policy and that the NRC requirements were applied in an appropriate manner.

3. I have read contention IV admitted by the Atomic Safety and Licensing Board. I have also read the reports of inspections conducted by Regional NRC Inspectors during: June 1981, November 1980, January/February 1980, September 1979, February 1979, February 1978, January 1978, January 1977, October 1976, and December 1975. A new Director of the Nuclear Energy Laboratory was appointed in the Fall of 1975. Therefore, my review of the reports of inspections was limited to that period for which the current Director of the Laboratory has had responsibility for the operation of the reactor facility. The results of these inspections identified three items of noncompliance. Notices of Violation were sent to the applicant by letters dated March 7, 1980 (2 items), and February 4, 1978 (1 item), for these three items of noncompliance. I am of the opinion that appropriate corrective actions were taken by the applicant to preclude recurrence of the items. Also, the records show that the actions were subsequently verified by NRC inspectors.

I consider the three items of noncompliance to be administrative technicalities with each having an insignificant potential to result in an event which could have consequences that could adversely affect the health and safety of the public. Subsequent to each NRC inspection, NRC enforcement policy and inspection procedures require that, generally, each item of noncompliance identified by an inspector during the course of an inspection be included in a Notice of Violation and formally sent to the licensee along with a report of the inspection. To assure uniform treatment of NRC licensees throughout the nation, and to provide incentive for NRC licensees to conduct licensed activities in strict compliance with NRC requirements, a Notice of Violation is issued for an identified item of noncompliance even though the significance of the item may be minimal. In addition, a licensee is required to respond to each item contained in a Notice of Violation unless the item was corrected in the presence of the inspector and involved a matter of minor significance.

Based on the foregoing and contrary to the contention, I am of the opinion that a pattern of violation of regulatory requirement has not existed over the past five years. Furthermore, I am of the opinion that facilities operations have been conducted during the past five years in a manner which demonstrates that reasonable assurance exists that future operations will be conducted in a safe manner and in substantial compliance with NRC requirements.

4. I have read contention III. admitted by the Atomic Safety and Licersing Board. On June 10, 1981, I conducted an investigation into the facts and circumstances wherein the applicant permitted unlicensed persons to manipulate, in the presence and under the direction of an NRC licensed individual, a spring return switch which caused a control blade in the reactor to be withdrawn and inserted while the reactor was operating. I am of the opinion that, under the circumstance, the manipulation of the said switch was deemed to have been performed by the licensed operator pursuant to the provisions of 10 CFR 55.4(d). which reads:

> "'Operator' is an individual who manipulates a control of a facility. An individual is deemed to manipulate a control if he directs another to manipulate a control." (Emphasis added)

Based on my review of the inspection reports mentioned above in paragraph 3 which cover the operation of the reactor over the past five years, and my observations on June 10, 1980, I am of the opinion that managerial and administrative controls in effect at the facility are adequate to provide reasonable assurance that the health and safety of the public will not be adversely affected by continued operation of the reactor under the present conditions.

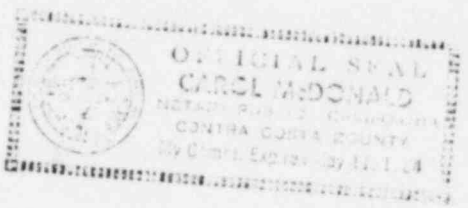
5. I have read the Declarations of Frank Wenslawski, Philip Morrill and Tolbert Young submitted in these proceedings and concur with the opinions and conclusions stated in each of the declarations.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Allen D. Johnson

Subscribed and sworn to before me
this 10 day of July, 1981

Carol McDonald
Notary Public



My Commission expires:

Allen Dale Johnson

STATEMENT OF PROFESSIONAL QUALIFICATIONS

My name is Allen Dale Johnson. I was born July 22, 1931, at New Salem, North Dakota. I am employed by the United States Nuclear Regulatory Commission as a Reactor Inspector in the Reactor Operations and Nuclear Support Branch, Office of Inspection and Enforcement, Region V, Walnut Creek, California.

I was graduated from the University of Idaho in 1953 with a Bachelor of Science degree in chemistry and received a Juris Doctor degree from John F. Kennedy University, Orinda, California, in 1971. I am a member of the California State Bar and am duly licensed to practice law in the State of California.

I served as an officer in the U.S. Navy from July 1953 to July 1955.

From November 1955 through April 1963, I was employed by the Atomic Energy Division of Phillips Petroleum Company at the National Reactor Testing Station (NRTS) near Idaho Falls, Idaho. During my entire employment with Phillips Petroleum Company, I worked at the Material Testing Reactor (MTR) in the Operations Department. My job assignments were: Reactor Technician, Reactor Engineer, Shift Foreman and Shift Superintendent. As Shift Superintendent (3 years), I was responsible for the safe efficient operation of the reactor, associated supporting facilities, and experiments.

From May 1963 to the present, I have been employed by the NRC/AEC as a Reactor Inspector. My duties have included inspection and investigation of licensed facilities and activities for the purpose of ascertaining safety of facility operations and related activities. In addition, the duties inlcude verification that activities conducted at licensed facilities have been performed in accordance with the rules and regulations of the commission. I have been the principal inspector for power, test, and research reactors during all phases of construction, startup testing, and subsequent operations. For the past several years I have also been the regional coordinator for enforcement. On Feburary 15, 1981, I was appointed Acting Director, Enforcement and Investigations in the NRC Region V Office.

CONTENTION V[1/]

This contention alleges that the amount of excess reactivity allowed by the technical specifications for the UCLA reactor ($3.00) could lead to

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1/ V. The amount of excess reactivity which is permitted by the Technical Specifications to be installed in this reactor is too great in that it does not provide a sufficient safety margin and thus could lead to a serious power excursion which could bring about melting of the fuel cladding and significant release of fission products, seriously endangering the public health and safety. Specifically:

1. The amount of excess reactivity permitted at this facility under its license should be limited to less than that needed for prompt criticality.
2. The reactor has lost several significant self-limiting features in that
   a. the level of excess reactivity has been changed so that it is now higher than that needed for prompt criticality,
   b. a deflector plate which prevented repeated excursions has been removed,
   c. the assumption that there is a large negative temperature coefficient appears to be wrong in light of information regarding a positive graphite temperature coefficient, and
   d. the reactor's power level has been increased from 10 Kw to 100 Kw.
3. The currently licensed amount of excess reactivity (2.3% Δ k/k) could cause melting of the fuel cladding according to the 1960 Hazards Analysis.
4. The value for the reactor's void coefficient has changed since the initial calculations were done.
5. Through the conversion of % Δ k/k as the excess reactivity limitation in the current Technical Specifications to $ in the proposed Technical Specifications and the use of a β different from that used in the Hazards Analysis, the Applicant may have changed the limitation thus presenting the potential for a serious excursion and melting of the cladding.
6. The assumption that Borax I and Spert I test results can be extrapolated to the UCLA reactor is questionable, particularly in the absence of error bars for the Borax I and Spert I data.
8. The analyses of excess reactivity characteristics of this reactor fail to include an adequate review of the nuclear safety literature relating to the relationship between excess reactivity and destructive power excursions.

(FOOTNOTE CONTINUED ON NEXT PAGE)

a significant power excursion and melting of the fuel cladding for the various reasons listed in the contention's subparts.

The attached affidavit of Sean C. Hawley, a research scientist employed by the Radiological Sciences Department at Battelle, Pacific Northwest Laboratory, who co-authored the laboratory study "Analysis of Credible Accidents for Argonaut Reactors" attests that this contention has no basis in scientific fact. Mr. Hawley explains that neither a step insertion of 2.6% Δ k/k excess reactivity nor prompt criticality would create a hazardous situation or fuel cladding melt (paragraphs 4 and 14). Since the Staff's proposed technical specifications adopted by Applicant in the 6/82 application amendment, limit the amount of excess reactivity to $3.00 (2.0% Δ k/k) (Tech. Spec. 3.1.2) which is well below the step insertion of 2.6% Δ k/k ($3.90) performed in the SPERT I tests (Hawley, para. 13), the Intervenor's assertion that the excess reactivity limit for the UCLA reactor should be lowered has no scientific basis. As

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1/ (FOOTNOTE CONTINUED FROM PREVIOUS PAGE)

9. The analyses regarding excess reactivity are based on unverified and unidentified assumptions which can be used merely to estimate a range of excess reactivity additions and their possible hazard and is thus inadequate to support present licensed limits. Additionally, error bars have not been provided for the computations and analyses.
10. The reactor has a pneumatic "rabbit" system that allows rapid insertion of excess reactivity. This system did not exist when the reactor was built and has experienced frequent operating problems since installation.
11. The proposed licensed limit on combined experiments or the current licensed limit could cause melting of the fuel cladding.
12. Removal of a beam tube could cause insertion of excess reactivity into the reactor because neutron absorption would be removed and reflection savings would be increased.
13. Applicant has violated excess reactivity limits suggesting it is impossible to prevent possible excursions.
14. Applicant failed to analyze the possibility of eutectic melting.

explained in paragraph 4 of Mr. Hawley's affidavit, prompt criticality was achieved a number of times in the BORAX and SPERT tests without causing fuel melting but, more importantly, in an Argonaut reactor, the design is such that it is "not credible for the available excess reactivity to be inserted rapidly enough to achieve prompt criticality." (Hawley, para. 4). Thus, the assertion in V.1 is groundless. Likewise, the allegations in V.2.a-d concerning prompt criticality, reactor excursions, positive graphite temperature coefficient and increased power level are without basis in fact. Mr. Hawley explains that the amount of excess reactivity available at Argonaut reactors is less than the amount that could cause fuel melting (para. 4); that power transients during BORAX tests resulted in water expulsion which acts as a shutdown mechanism in Argonauts (due to decrease in the water moderator) (para. 5); that the graphite temperature coefficient acts on a slower time scale than the water temperature coefficient so that the negative worth of control blades can accommodate any positive graphite coefficient (para. 6); and that an increase in power level from 10 Kw to 100 Kw results in only small increases in fuel and moderator temperatures and a trivial excess reactivity increase (para. 7). Thus, V.1 and V.2 must be dismissed since no material issue of fact underlies these allegations.

Section V.3 of the contention repeats the allegation of possible fuel cladding melt by referencing the application.[2/] (See Supplemental Contentions pp. 44-45.) The UCLA hazard analysis in the amended application states at p. III/8-1 that fuel melt will not occur in an Argonaut. Thus,

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2/ Intervenor referenced pp. III/A-3 to 5 to show that the (withdrawn) hazards analysis stated that fuel melt will occur at 2.3% ΔK_{eff}. On the contrary, p. III/A-5 states that melting will not occur at 2.3%. Thus, the reference to the 1960 hazards analysis does not support the contention.

the reference to the application does not support the contention. Further, Mr. Hawley notes that calculations in hazards analyses usually include the most conservative values so that the amount of uncertainty which is tolerable depends on how the parameter is used in the calculation and the importance of the calculation itself (para. 11). Subsection V.3 must be dismissed since it has no factual basis.

The change in the void coefficient raised as an issue in V.4, is explained in the Supplemental Contentions at p. 46 where the Intervenor asserts that the changed void coefficient will produce fuel clad melt above 2.1%. Δ k/k. As explained previously, even 2.6% Δ k/k will not cause fuel melting (Hawley, paragraph 14). Additionally, the Staff's proposed technical specifications (adopted by Applicant's amendment to the application) have reduced the limit of excess reactivity to $3.00 which is the equivalent of 2.0% Δ k/k, less than the 2.1% Δ k/k alleged to be appropriate by the Intervenor. Thus, the change in void coefficient does not raise an issue of material fact, and V.4 must be dismissed.

Section V.5 alleges error in the mathematical conversion of % Δ k/k to dollars and cents which Intervenor asserts would result in an increase in excess reactivity limits. The present UCLA licensed limit is 2.3% Δ k/k. After conversion, the 1980 application's proposed technical specifications designated the limit as $3.54. Staff Interrogatory 33 elicited a response stating that the Intervenor does not contend that the excess reactivity limits were changed after the conversion, but simply that it may have been changed depending on the beta value used. Applicant's response to Intervenor's Interrogatory No. 42 states that the beta value used for the conversion was 0.0065. Thus: $3.54 = 2.3% so that no increase in limits

was proposed by Applicant because of the conversion and no issue of fact exists to support the tentative allegation. It appears then, that subpart V.5 is really a request for information rather than a contested issue. Since the information was provided during discovery, no issue exists and subpart V.5 should be dismissed.

Subpart V.6 raises a question of the extrapolation of BORAX I and SPERT I tests to the UCLA reactor in the absence of error bars in the Applicant's hazard analysis. Staff Interrogatory 34 obtained the response from Intervenor that it has no opinion or information about what error bars should have been used, but that if error bars had been used, the excess reactivity limits would be lowered. Mr. Hawley points out (paragraph 11) that conservatism in the calculational process of hazards analyses normally eliminates the necessity to include error bars, i.e., they are not necessary when the calculation itself is sufficiently conservative. Further, Mr. Hawley explains (para. 13) that the research analysis contained in NUREG/CR-2079 did not use or extrapolate from BORAX data and rests on SPERT I data which was superior to BORAX data. The more recent research in NUREG/CR-2079 verified previous BORAX tests which indicated that a step insertion of 2.6% Δ k/k will not cause fuel melt in an Argonaut. Subpart V.6 must be dismissed for failure to raise an issue of material fact.

Subparts V.8 and V.9 are similar to subpart V.6 in that they allege that the application contains faulty analyses concerning excess reactivity and power excursions. The affidavit of Mr. Hawley (para. 13) points out that the recent research performed by him and his associates analyzed power excursions in Argonauts using SPERT I data, and, of course,

NUREG/CR-2079 is recently performed research based on data from experimental tests concerning excess reactivity and other phenomena in Argonauts with a full documentation of references at the conclusion. Therefore, the issues alleging faulty analyses and unverified assumptions in the application contained in these subparts have no basis in fact since recent research has been performed concerning possible accidents in Argonauts and is incorporated by reference in the application. Subparts V.8 and V.9 should be dismissed for failure to raise an issue of material fact.

Subpart V.10 alleges that the reactor's experimental pneumatic rabbit system allows rapid insertion of reactivity, but the Intervenor's response to Staff Interrogatory 37 admits that the allegation has no basis in any calculations or references of the Intervenor.

Mr. Hawley explains in paragraph 12 of his affidavit that the small amount of material contained in the plastic cylinder (termed a "rabbit") would not affect the reactor's reactivity except for a few elements or isotopes. These particular elements are known to have potential effect on reactivity and could not inadvertently be inserted into the reactor particularly since experiments are subject to review prior to implementation. (See proposed technical specification 3.5.1.3.E) Thus, the assertion that the experimental rabbit system allows rapid insertion of excess reactivity has no factual basis and V.10 must be dismissed.

Subpart V.11 of this contention points out unclear language in the 2/80 application's proposed technical specification 3.5.1.3.B which appears to allow the reactivity worth of experiments to equal the reactivity limit of technical specifications 3.1.2 for the core. The Staff' proposed technical specification 3.5.1.3.B adopted by application amendment of 6/82

limits the sum of experiments and core tc $3.00. Thus, the issue raised is mooted by Staff's language modification and application amendment and there is no issue of material fact underlying this subpart.

Subpart V.12 alleges that removal of the beam tube could adversely affect excess reactivity, whereas Mr. Hawley's affidavit at paragraph 8 explains why removal of a beam tube does not change neutron leakage or reflection properties of the core. Intervenor's response 38 to Staff's Interrogatory on this matter merely restates the contention. Thus, no basis has been provided or exists to suggest that beam tube removal affects excess reactivity in the reactor. This subpart V.12 should be dismissed for failure to raise an issue of material fact.

Subpart V.13 is based on a 1969 I&E report citing UCLA for violation of its excess reactivity limits. (Supplemental Contentions, p. 56) This occurrence hardly supports the allegation that it is "impossible" to prevent excursions. It is self-evident that a violation of technical specifications operating limits is exactly that, i.e., failure by the operator to operate the reactor according to the licensed limits. No basis is provided to show how control of excess reactivity limits is "impossible." Intervenor's response to Staff Interrogatory 39 merely states that Applicant may once again violate excess reactivity limits and that the "history" of violations gives grounds for belief that it is impossible to prevent such violations. Clearly this characterization of one violation is insupportable and gives no credence to the assertion. Subpart V.13 has no factual basis and should be dismissed.

Subpart V.14 alleges that Applicant has failed to analyze possible eutectic melting. This allegation is baseless, since the accident analysis contained in the application at p. III/8-1 discusses fuel plate melting and references the Battelle and LANL studies which demonstrate that core melt in an Argonaut reactor is not credible. Thus, the consequences of fuel plate melt is considered in the application.

The affidavit of Mr. Hawley states that the melting point of eutectic is 640°C (paragraph 9); that research conducted in connection with NUREG/CR-2079 indicates a step insertion of 2.6% Δ k/k will not cause fuel melting (paragraph 14). [See also: NUREG/CR-2198 analysis of fuel temperature in an Argonaut].

Intervenor stated it had "no information" in response to Staff Interrogatory 40 asking whether Intervenor could provide references showing a difference in the UCLA eutectic fuel from that analyzed by experiments in the MTR, EBR, other Argonauts, and SPERT and BORAX tests. Since Intervenor cannot provide a reason that UCLA should provide an additional analysis of eutectic melting and since such analysis is documented as results of various experiments, Intervenor has not raised an issue of material fact by this subpart.

In summary, none of the many bases in the subsections 1-14 of Contention V support the allegation that the licensed excess reactivity could lead to a power excursion and fuel melt. Nothing provided by Intervenor in the Supplemental Contentions or discovery show that a material issue has been raised. Conversely, the affidavit of Mr. Hawley demonstrates clearly that no insertion of excess reactivity to the degree sufficient to create

fuel melting could occur at the UCLA reactor. Therefore, Contention V must be dismissed since it does not rest on an issue of material fact.

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)	)	

AFFIDAVIT OF SEAN C. HAWLEY
IN SUPPORT OF MOTION FOR SUMMARY DISPOSITION

I, Sean C. Hawley, do hereby depose and state:

1. I am a Research Scientist employed by Battelle Pacific Northwest Laboratory in the Health Physics Technology Section of the Radiological Sciences Department. A statement of my professional qualifications is attached to this affidavit.

2. I have read contention V admitted by the Atomic Safety and Licensing Board. The discussion that follows results from NUREG/CR-2079, "Analysis of Credible Accidents for Argonaut Reactors," of which I was a principal author and which is based on research at the Pacific Northwest Laboratory operated by Battelle Memorial Institute.

3. To permit periods of full power operation of reasonable duration it is often necessary that the amount of excess reactivity exceed the amount that could cause prompt criticality if inserted instantaneously. The excess reactivity primarily compensates for the action of negative temperature coefficients and the unavoidable accumulation of transitory reactivity poisons, i.e., xenon poisoning. Furthermore, additional excess reactivity is necessary to achieve the following operating goals:

   a) Provide additional time for operation of the reactor before poisons and U-235 consumption make it necessary to replace fuel in the core with fresh fuel.

   b) Minimize handling of radioactive fuel and components for rearrangements to optimize fuel burn up.

   c) Minimize costs for fuel handling and spent fuel storage.

   d) Allow a range of experiments to be conducted.

4. Attaining prompt criticality in a reactor does not necessarily create hazardous conditions. In the BORAX and SPERT series of reactor transients, prompt criticality was achieved a number of times, with varying amounts of reactivity, without causing any fuel melting or fission product release. The fuel elements used in the BORAX and SPERT reactors were the same general design as the ones used in Argonaut-type reactors today. Therefore limiting the maximum credible excess reactivity to an amount that could not permit the reactor to attain prompt criticality does not necessarily eliminate potential hazardous situations and could conceivably create other hazards. For example, with less excess reactivity, refueling or rearrangement of fuel elements could be more frequent. Both of these operations, which require fuel handling, place the fuel in closer contact with the environment than if the fuel remained in the core.
Safely accommodating prompt criticality depends primarily on the amount of reactivity inserted, the time within which it is inserted and characteristics of the reactor such as the prompt neutron lifetime and the heat capacity of the fuel. Since the Argonaut-type reactors do not have components like transient rods and specialized drive mechanisms that are designed for achieving prompt criticality, it is not credible for the available excess reactivity to be inserted rapidly enough to achieve prompt criticality. Also, the typical amount of excess reactivity available at Argonaut-type reactors is less than the amount that could cause fuel melting if inserted rapidly (see response No. 13).
Therefore, simply setting a limit on the amount of available excess reactivity that is numerically equal to the amount that would nominally create prompt criticality if inserted stepwise (i.e., equivalent to the value of β_{eff} for the reactor) may not be necessary to ensure the health and safety of the public. Conceivably such limits could create situations where the release of fission products to the environment is more credible, e.g., more frequent fuel handling.

5. As observed in the BORAX series of tests, water explusion often accompanied the initial power transient. Such an explusion of water will act as a shut down mechanism in reactors like the BORAX and Argonaut-types where the water provides necessary moderation. If the expelled water returned to the core, presumably other transients could occur, created by similar cycles of water explusion and return. Such behavior (commonly called "chugging") was observed in the BORAX tests. Since the quantity of water used in the Argonaut-type reactor is relatively small (about 30 times less than the quantity used in the BORAX reactor tank) it is doubtful that repetitive pulses could be maintained for the following reasons. A loss of available reactivity due to the increasing water temperature resulting from each transient would reduce successive transients until a steady-state power level was reached. Second, in the Argonaut-type design interstitial voids in the surrounding graphite and cement blocks should permit water vapor to escape and accomodate or provide drainage for a quantity of water. Therefore when a sufficient quantity of water evaporated or leaked into interstitial voids the succession of pulses would be terminated.

6. The graphite temperature coefficient, whether positive or negative, would not act on the same time scale (i.e., it would take longer to affect reactivity) as the (negative) water temperature coefficient because of the longer time required for transfer of heat to the graphite. The increase of available reactivity through the action of this coefficient, if any, would be slow and the negative worth of the control blades should compensate for the reactivity gain, even if the positive graphite temperature coefficient is about equal to the negative water temperature coefficient. The inherent shutdown mechanisms of Argonaut-type reactors also include the effects of the negative water temperature coefficient, negative water void coefficient and changes in fuel plate morphology (e.g. expansion) which all act to decrease reactivity.

7. Increasing the power level of the reactor to 100 kW_{th} does not per se increase the potential for fuel melting. Essentially the only physical change necessary to increase the power level is increased flow rate of the primary cooling system to permit the additional heat generated at the increased power level to be removed and thus maintain the moderator temperature low enough to prevent loss of reactivity by the (negative) temperature coefficient. The full power operating temperatures of the fuel and moderator are only a few degrees greater than for full power operation at 10 kW_{th}. The increased neutron flux at the higher power level should require only a trivial increase in excess reactivity (depending upon the operating schedule) to compensate for increased concentrations of neutron poisons and fuel burn up. Increased power would produce a greater concentration of fission products for a given period of operation than would occur at lower power. However none of these factors affect the likelihood of producing a power excursion that would cause fuel melting. The decay heat from the accrual of fission products at the higher power level would be insufficient to melt the fuel even with a loss of coolant accident.

8. Removing a beam tube would not substantially alter the configuration or material composition of the Argonaut-type reactor. Beam tubes are typically closed-end aluminum tubes 4 to 10 inches in diameter that penetrate the biological shield to various depths. Removing the tube only eliminates a rather thin, shell-like auxiliary structure which should not markedly change the neutron leakage or reflection properties of the core. However, if the normally air filled volume of the tube is filled with another material, the core neutronics could be changed. The reactivity change would depend on the size and location of the beam tube and the reactivity worth (which can be negative as well as positive) of the material that is hypothesized to fill the tube volume. An analysis of this type of perturbation was included in the applicant's 1960 and 1980 Safety Analysis Reports.

9. The composition of the uranium-aluminum alloy fuel used in Argonaut-type reactors is essentially at the eutectic composition for uranium and aluminum. The melting point of aluminum is typically given as 660°C (1188°F) and that of the eutectic as 640°C (1152°F). Although the fuel "meat" could conceivably melt before the aluminum cladding, the small difference between the two melting points is well within the range of the

margins used in safety analyses. However, the question is moot as the lowest possible temperature at which the fuel would be expected to melt is generally used in hazards analyses.

10. Both the limits on the worth of experiments and any necessary precautionary measures are normally specified in the Technical Specifications for each research reactor. Typically, the total worth of experiments is limited to an amount no greater than the licensed maximum excess reactivity. In addition, there are normally requirements for maintaining the total excess reactivity derived from fuel and experiments at or below an amount that would not produce a power excursion capable of melting fuel. For experiments with a large worth, some fuel may have to be removed or rearranged to maintain the total excess reactivity at or below this specified value. Even if the total excess reactivity were twice the licensed maximum core excess (i.e., the maximum experiment worth plus the maximum fuel worth) the reactivity generated by the experiment may not have a credible means of being inserted fast enough to create a power transient.

11. Calculations done for safety or hazards analysis purposes generally include the most accurate and conservative values known for the parameters included in the formulations. The values may be obtained from theory or experiment. Given the uncertainties normally associated with values measured or derived for such parameters as the void coefficient and β_{eff}, and the bias induced by the desire to be conservative, a certain amount of change in a parameter may be tolerated without adversely impacting the answer. The amount of uncertainty tolerable depends on how the parameter is used in the calculation and the importance of the calculation itself. Typically, sufficient conservatism in the calculational process eliminates the necessity to determine, if not previously known or readily available, the uncertainty, i.e., error bars, of parameters, whether obtained from theory or experiment, e.g., BORAX and SPERT tests results.

12. Pneumatic sample transfer systems (rabbit systems) are designed to irradiate samples for relatively short and precise time periods and rapidly move the sample into and out of the irradiation terminus that is located near or in the core. Therefore if the sample or device irradiated has some measurable reactivity worth, the ability to create a rapid change in reactivity exists. Only a few elements or isotopes have the potential for producing a significant or even measurable change in the reactor's reactivity either upon introduction to or removal from the neutron flux typically found in the irradiation ports of Argonaut-type reactors. The amounts of these elements or materials required to affect the reactivity will vary, but are generally on the order of tens to hundreds of grams of material. Some elements, such as uranium, would have to be enriched in a particular isotope (e.g., ^{235}U) for the reactivity effect to be maximum. The volume associated with typical rabbit systems is relatively small (e.g., about 10 to 20 cm^3) and essentially the entire volume would have to be filled with one or more of those materials that could potentially affect the reactivity. Extrapolation from experimental data on the reactivity effects of small amounts of these types of materials could be performed to predict the effect if the entire "rabbit" volume was filled

with one or more of these materials. However, the review system for experiments, standard operating procedures, and physical layouts that exist at research reactors preclude for all practical purposes the inadvertent introduction of enough of these materials to produce a significant reactivity change.

13. The methods in NUREG/CR-2079 for analyzing power excursions or transients in the Argonaut-type reactors did not use or extrapolate from BORAX data nor was the void coefficient explicitly used in the calculations. The SPERT 1 data and methods were used in a separate although similar method for the power transient analysis. The extent and availability of the SPERT data were superior to the data for the BORAX tests and a comparison of the BORAX 1, SPERT 1 and Argonaut-type reactor yielded no overwhelming reason to use BORAX data. Based on a review of the inadvertent transient syndrome for Argonaut-type reactors using the methods and results from the SPERT I series of tests, a step insertion of 2.6% $\Delta k/k$ would not raise the temperature of the fuel enough to cause any fuel melting. The fuel hot spot was estimated to be 448°C and although data from the SPERT series of tests suggest that a hot spot of 590°C might occur, both are below the eutectic temperature (640°C) of the fuel.

14. The research conducted in connection with NUREG/CR-2079 indicates that a step insertion of 2.6% $\Delta k/k$ would not cause any fuel melting and furthermore that no credible, accidental means exist for inserting this or greater amounts of reactivity fast enough to create an inadvertent power transient.

I hereby certify that the preceding information is true and correct to the best of my knowledge and belief.

Sean C. Hawley

Subscribed and sworn before me this
28th day of October, 1981.

Robert L. Steuhm
Notary Public

ROBERT L. STEUHM, NOTARY PUBLIC
RESIDING IN [illegible] COUNTY, [illegible]
COMMISSION EXPIRES AUGUST 15, 1982

My commission expires: _____

SEAN C. HAWLEY

Professional Qualifications

My name is Sean C. Hawley. I am a research scientist employed by the Radiological Sciences Department at Battelle, Pacific Northwest Laboratory, Richland, Washington. I provide support to senior staff in external contacts with sponsors and technical experts and occasionally direct the activities of small groups. I occasonally interact directly with sponsors and scientists external to my group and usually publish as a junior author.

I received a Bachelor of Arts Degree in Chemistry from Reed College, Portland, Oregon in 1978. In addition, I have completed 10 credit hours of graduate level studies in Radiological Sciences at Washington State University and the University of Washington (Joint Center for Graduate Studies, Richland, Washington).

I have about eight years of experience working in areas related to research reactors. I received my first Senior Operator's Permit in 1973 for the Reed College Reactor Facility. I was employed there as a Senior Reactor Operator, Assistant Health Physicist, Reactor Supervisor and Training Supervisor. I received my second Senior Operator's Permit in 1979 for the Washington State University Reactor. I was employed there as Reactor Supervisor.

I am a member of the American Chemical Society.

CONTENTION VI[1/]

The basis cited in support of this contention is the 1975 Inspection Report 50-142/75-01 written by Inspector Wenslawski, affiant in support of summary disposition of Contention IX. In that affidavit he states (at p.2) that since the citation for emissions exceeding technical specifications in 1975, UCLA has corrected this matter and has been inspected by I&E specifically on this item every year since the occurrence. Therefore, the Intervenor's basis of a past event to show a present noncompliance has no merit.

Additionally, the 1975 excess emissions was the subject of a 10 C.F.R. § 2.206 request to shut down the UCLA reactor by CBG on October 3, 1979 to the Director of NRR. The request was denied and a lengthy explanation of the facts of the matter was provided to CBG with the Director's decision (copy attached). The Commission declined review of this decision.

1/ VI. Applicant has in the past and is at present emitting excessive radiation, violating radiation standards, and conducting inadequate monitoring. Applicant has failed to demonstrate in its application or in its recent performance any evidence that these conditions can reasonably be expected to improve in the future, in the absence of which demonstration grant of an operating and SNM license cannot be made without undue threat to public health and safety. Specifically:

2. Several conditions which cause present emissions to be in excess of applicable standards have not been changed; therefore, emissions which are in excess of applicable standards can be expected in the future.

3. Applicant has not in the past nor in the present application been able to reasonably demonstrate that exposure in unrestricted areas is not in excess of applicable standards because it lacks an adequate radiation monitoring system.

4. Applicant has not complied in the past and presently does not comply with the radiation standards in 10 CFR §§ 20.1c, 20.106(b)(1) and (2), 20.106(c), and Part 20, Appendix B.

5. Applicant does not now, has not in the past, nor can it reasonably assure that it will in the future meet the requirements of Section V.d of its current technical specifications which states that "[t]he release of radioactivity from the reactor facility shall be kept to as low a level as practicable."

Nevertheless, the Intervenor alleges that because emissions exceeding technical specification limits were discovered at UCLA in 1975, that these excess emissions continue. In so doing, the Intervenor ignores the detailed explanation provided it concerning the error in stack height contained in the previous technical specifications; the improper size nozzle previously in place on the stack causing too high a concentration release rate; and the previous calibration error. (Supplemental Contentions, pp. 66-68). As discussed in the Director's Decision, Amendment 10 to the UCLA license, issued in 1976, addressed and corrected these matters.

Additionally, Intervenor raises the issue of ALARA related to 10 C.F.R. Part 50, Appendix I as well as 10 CFR Part 100 (Supplemental Contentions, pp. 73-75). These regulations apply only to power reactors and are not relevant to this research reactor. However, Part 20 does contain an ALARA provision.

Intervenor's response to Staff Interrogatory 41 alleges that present emissions by UCLA are above Maximum Permissible Concentrations (MPC) and that emissions have increased since 1976, referencing the Application II/2-5 and a 1979 Annual Report.

The Application reference explains that the increase in emissions is due to increased use of the reactor. Thus, no issue is raised by this fact, and, contrary to the assertion, the reported emissions are not above 10 C.F.R. Part 20 limits since the emissions reported are at the stack and do not include use dispersion and occupancy factors set out in Part 20 Appendix B. (See affidavit of Seymour Block, attached, p. 1). 10 C.F.R. § 20 Appendix B Table II sets out the unrestricted area release limit for ^{41}Ar at 4×1^{-8}. As shown by the affidavit of Mr. Block (para. 3) the UCLA emissions into unrestricted areas are well below Table II limits.

CBG response to Staff Interrogatory 43 states no basis to support the allegation that the UCLA monitoring system is inadequate to accurately reflect emissions except the recent I&E report 80-03 concerning monitor discrepancies. But, as stated by Inspector Wenslawski in his affidavit (p. 2), the discrepancy is insignificant.

Intervenor response to Staff interrogatory 44 alleges that ALARA could be better achieved by air vent repositioning, stack height and flow rate increases, and decay tanks. The Intervenor uses data from Applicants' records incorrectly to attempt to show high levels of emissions.[2/]

The affidavit of Seymour Block demonstrates that since the issuance of Amendment 10 to the UCLA license that UCLA emissions have been in compliance with Part 20 limits; that the environmental monitoring program conducted by UCLA resulted in reliable and conservative measurements of radiation releases; that the measurements showed that only a fraction of Part 20 permitted levels are being released into unrestricted areas; that the Intervenor's proposed modifications would not produce any ALARA benefits; and that UCLA does now comply with all Part 20 requirements, including ALARA.

Therefore, based on the explanations previously provided with the Director's Decision denying the CBG request for plant shutdown on the basis of excessive radiological emissions; the affidavit of Inspector Wenslawski explaining the verification by I&E since 1976 of UCLA compliance with Part 20; and the

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2/ In response 44 the Intervenor multiplies the TLD readings in the application by the Applicant's dose calculation rather than by the maximum operating time factor of 1.8.

affidavit of Seymour Block demonstrating UCLA emissions to be small fractions of Part 20 limits and as low as reasonably achievable (ALARA), and the failure of Intervenor to show any basis for this contention, the Staff submits that there is no material issue of fact underlying Contention VI and that it must be summarily disposed as a matter of law.

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)	)	

AFFIDAVIT OF SEYMOUR BLOCK
REGARDING CONTENTION VI

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Seymour Block being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Division of Systems Integration, Radiological Assessment Branch. My professional qualifications are attached to this affidavit.

2. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention VI, which I have read in its entirety.

3. The ^{41}Ar emissions from the UCLA reactor stack into unrestricted areas are well below 10 CFR Part 20 Appendix B Maximum Permissible Concentration (MPC) limits. The concentration measured at the stack is 1.65×10^{-5} μCi/ml. The reactor is operated 5% of the year. The appropriate meteorological dilution factor for the unrestricted area surrounding the reactor stack is 4.67×10^{-3}. Thus the resulting calculation of ^{41}Ar emissions is
1.65×10^{-5} μCi/ml x .05 x 4.67×10^{-3} = 3.8×10^{-9} μCi/ml which is significantly less than the Part 20, Appendix B limit of 4×10^{-8} μCi/ml for ^{41}Ar.

4. In granting Amendment 10 to the UCLA Technical Specifications on February 5, 1976, the Staff imposed a condition on UCLA whereupon they were to implement an environmental monitoring program for two years to measure the effects of effluent releases of ^{41}Ar from the reactor stack. The basis for this monitoring program was that, by measuring the integrated dose over selected periods of time, the program would be simultaneously factoring in effluent release concentrations, total time of release, meteorological effects, and doses to a maximum individual (i.e. one who occupies the space providing the greatest dose 100% of the time).

5. The TLD dosimeter material used in the measurements [$CaSO_4$(DY)] is recognized as a very sensitive and stable phosphor and presents precise and energy independent measurements of doses as low as 0.5 mr.

6. The two year environmental TLD survey program undertaken by UCLA involved 20 dosimeter locations. The results of the study for all 20 locations showed an average annual exposure of about 30 mrem with the maximum annual exposure of about 43 mrem at the effluent exhaust location (i.e. top of the stack). The dosimeter at this location was supported on a wire screen in the center of the airstream. In placing the dosimeters at their respective locations, eleven of the twenty dosimeters were placed upon concrete thereupon causing readings that cannot be considered entirely representative of any ^{41}Ar radiation. This is because concrete contains traces of naturally occurring radioactivity that would affect the results of the environmental survey. It is well known that concrete contains sufficient quantities of uranium, thorium and ^{40}K so that a significant fraction of the exposure of these eleven dosimeters could be from these sources of radioactivity. Experimental measurements made at one meter above a finite concrete surface have shown an exposure range of 10-20 mr/yr.

7. If we, therefore, exclude these eleven exposures from the twenty TLD readings, the average is about 20 mrem/yr. This smaller exposure value is still considered conservative, on the high side, since radiation from concrete would affect dosimeter read-out and, therefore, exposure evaluation. Even including the anomolous readings in the overall average, 30 mrem/yr. is only 6% of 10 CFR Part 20 permissible levels in unrestricted areas (20.105(a)) and this dose would be received by an average individual assuming 100% occupancy during ^{41}Ar release, which is again, conservative.

8. If the dose values given for maximum permitted operating schedules are adjusted, then the response values for unrestricted areas are increased by a factor of 1.8. These new exposure rates would still remain a small fraction of the 10 CFR 20.105 limit and would not change the Staff's conclusions that the effluent releases are within the limits of 10 CFR 20 and are ALARA, based on state of the art technology and prevailing practices.

9. Although the TLD measurements did not include the beta contribution to dose, beta dose can be inferred from the gamma dose as follows: For an infinite semispherical cloud of ^{41}Ar (i.e. about 1000 meters radius for gamma radiation and about 4 meters radius for beta radiation), the beta to gamma dose ratio per unit radioactivity concentration (e.g. skin to total body) is about 0.3. For a finite ^{41}Ar cloud of about 50 meter radius, the beta dose would not change, but a correction factor of 0.15 is applicable for the gamma dose factor based on Staff calculations. The beta to gamma dose factor ratio is 2. Therefore, using the 30 mr/yr exposure to the average individual as the gamma total exposure, the applicable beta skin dose is about 60 mrad/yr. Since there is no skin dose

permissible limit for unrestricted areas in 10 CFR Part 20, we can assume the occupational radiation exposure limits ratio of skin dose to total body dose as being relevant. This ratio is 6. Consequently, the skin dose limit would be $\frac{0.5 \text{ rem}}{\text{year}} \times 6 = \frac{3 \text{ rem}}{\text{year}}$ for the unrestricted areas. Therefore, 60 mrad/yr is equivalent to 2% of the permissible limit for skin dose.

10. Although the CBG suggests that the conditions of ALARA are not met with the present stack design, the Staff has reviewed the design proposal of raising the stack an additional eighteen feet, and finds that the increase would have no significant effect on dispersion calculations. The overriding consideration is the height of adjoining structures which would negate any increased dispersion which might otherwise apply. Consequently, the proposed height increase of eighteen feet would have minimal beneficial effect on dispersion of effluents and, therefore, minimal effect on radiation doses attributable to ^{41}Ar. As a result no cost/benefit relationship can be established.

11. In response to CBG concerns with respect to 20.106(b)(1) and (2) and 20.106(c), Amendment 10 to the Technical Specifications allows dilution, use and occupancy factors for averaging the concentrations between the point of discharge and occupied roof areas (20.106(d)). As stated previously however, the TLD environmental surveillance programs takes account of all factors required by 20.106(c)(1), (3), (4), and (6), so that the Licensee is in compliance with 20.105(a) in determining the dose to a maximum individual.

12. In summary, for the reasons explained in the above paragraphs, it is my opinion that the UCLA research reactor emissions comply with 10 CFR Part 20 limits and are as low as reasonably achievable (ALARA); and that the radiation monitoring system is adequate to show such compliance.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Seymour Block

Subscribed and sworn to before me
this [illegible] day of [illegible], 1981

Notary Public

My Commission expires: July 1, 1982

SEYMOUR BLOCK

PROFESSIONAL QUALIFICATIONS

RADIOLOGICAL ASSESSMENT BRANCH

DIVISION OF SYSTEMS INTEGRATION

I am employed as a member of the staff of the Radiological Assessment Branch, Division of Systems Integration, U.S. Nuclear Regulatory Commission, Washington, D.C. My duties include the determination and evaluation of the design and operation of operating nuclear power plants as well as review of Safety Analysis Reports of applicants for construction permits and operating licenses of nuclear power plants with respect to safety and environmental impact considerations including matters related to Health Physics Radiation Protection Programs.

I first became associated with the atomic energy program in 1944 when I was trained and educated as a Health Physicist at Clinton Laboratories in Oak Ridge, Tennessee, during the Manhattan Engineering Project. I later joined the Brookhaven National Laboratories as a Health Physicist responsible for radiological safety of Chemistry and Reactor operations. In 1953 I transferred to the University of California Radiation Laboratory and set up a small Health Physics program at the Livermore site. When the Livermore Hazards Control Department was formed in 1959, I was made Section Leader of the Special Projects Research and Development Group. For twelve years I engaged in Research and Development in Radiological Instrumentation and Applied Health Physics.

I am a Certified Health Physicist and former Treasurer of the Health Physics Society. I am Past President of the Northern California Chapter of the HPS and a former consultant to Physics International Corporation in San Leandro, California.

From 1938 - 1941 I attended City College in New York. I was inducted into the Army Air Force in 1942 and attended the University of Pennsylvania, Moore School of Electrical Engineering from 1943 - 1944.

I have published numerous articles in technical journals on instrumentation development and radiation dosimetry. I am a member of the Health Physics Society.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SEP 24 1980

Docket No.: 50-142 (DD-80-30)

Committee to Bridge the Gap
Attn: Mr. Daniel O. Hirsch
10915 Strathmore Drive
Los Angeles, California 90024

Dear Mr. Hirsch:

This letter is written in response to your petition of October 3, 1979, which requested that the NRC issue an order shutting down the UCLA research reactor and take other actions regarding public hearings on renewal of the UCLA operating license. The petition has been treated as a request for action under 10 CFR 2.206 of the Commission's regulations.

Your request to shut down the UCLA research reactor has been denied for the reasons set forth in the attached "Director's Decision under 10 CFR 2.206". Your request for hearings and intervention in the proceeding on the renewal of the UCLA license is before the Atomic Safety and Licensing Board for action. The position of the NRC Staff embodied in my decision does not, however, preclude litigation of the issues raised in your petition in the license renewal proceeding if the Licensing Boards admits your contentions as issued in the proceeding.

A copy of this decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in 10 CFR 2.206(c), this decision will constitute the final action of the Commission twenty days after the date of issuance, unless the Commission on its own motion institutes review of this decision within that time.

Sincerely,

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

cc: University of California at Los Angeles
Attn: Dr. Harold V. Brown
Environmental Health & Safety Office
Los Angeles, California 90024

DD-80-30

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
HAROLD R. DENTON, DIRECTOR

In the Matter of

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA (UCLA Research Reactor)	)))	Docket No. 50-142 (10 CFR 2.206)

DIRECTOR'S DECISION UNDER 10 CFR 2.206

By petition dated October 3, 1979, Daniel O. Hirsch, on behalf of the Committee to Bridge the Gap (CBG), requested that the Chairman of the Nuclear Regulatory Commission (NRC) issue an order shutting down the University of California, Los Angeles (UCLA) research reactor pending resolution of certain safety issues. The petition also requested that other actions be taken regarding the renewal of the reactor's operating license. This petition was referred to the Staff as a request for action under 10 CFR 2.206 of the Commission's regulations. Notice of receipt of CBG's petition was published in the Federal Register, 44 Fed. Reg. 70241 (December 6, 1979). UCLA responded to the petition by letter to the NRC dated January 3, 1980.

The actions requested by CBG, in addition to the order to shut down the UCLA reactor, were:

1. Hold public hearings on the renewal of the reactor's operating license (which had been scheduled to expire in March 1980).
2. Grant CBG formal intervenor status in the renewal proceeding.
3. Notify CBG of any hearings or action taken pursuant to the renewal of the license.

On February 28, 1980, UCLA filed a timely application for renewal of the license. Notice of this proposed renewal was published in the Federal Register, 45 Fed. Reg. 28028 (April 25, 1980). On May 22, 1980, CBG filed a petition for leave to intervene in accordance with 10 CFR 2.714. The NRC Staff responded to the CBG petition on June 11, 1980, and stated its position that CBG satisfied the requirements for interest and standing. On June 10, 1980, an Atomic Safety and Licensing Board was established to rule on petitions for leave to intervene and requests for hearing, 45 Fed. Reg. 40747 (June 16, 1980). The CBG petition to intervene and the Staff response are now pending before the Board, thus obviating the need for this office to respond to CBG's request to hold public hearings and to grant CBG formal intervenor status in such hearings on the matter of license renewal.

The safety issues discussed below have also been set forth as contentions in CBG's petition for leave to intervene in the license renewal proceeding. The position taken by the Staff in this decision, however, in no way precludes the litigation of these contentions in the license renewal proceeding before the Licensing Board should the Board admit them as issues in the proceeding.

Response to Safety Issues Raised by CBG

In its petition CBG contends the UCLA research reactor is unsafe and requests that it be shut down. The bases for its contention are that the effluent from the reactor exhaust stack exceeds the Argon-41 concentration permitted by 10 CFR Part 20, Appendix B, and that a license amendment changing the prescribed concentration limit set forth in the license which the NRC granted, failed to consider the potential radiation exposures within the adjacent Math Sciences building.

In January, 1975, the NRC Region V office conducted an inspection of the UCLA facility. The principal reason for the inspection was to review the potential effects of gaseous effluents on facilities that had been constructed around the reactor facility subsequent to its original licensing. Although it was believed that the licensee was complying with 10 CFR Part 20 effluent requirements, it was felt that the evolving facilities at UCLA were deserving of review from the perspective of good health physics practice. The inspection revealed that a gaseous effluent exposure pathway was likely for nearby adjacent rooftop facilities. It appeared appropriate to the inspector that the significance of the pathway be evaluated and during the inspection the licensee agreed to evaluate the radiological impact of effluents on nearby facilities. It should be noted that the licensee had previously considered such an evaluation but as of the time of the inspection, no specific action had been taken. The inspection also resulted in two items of noncompliance:

1. Air drawn from the reactor room was not diluted to the specified flowrate and was not exhausted at the specified height above ground level.
2. The reactor room area radiation monitors and the gaseous effluent monitor had not been calibrated at the required frequency.

A question of the adequacy of the method used to calibrate the effluent monitor was also discussed with the licensee but not identified as an item of noncompliance. The licensee's reply to the Notice of Violation issued for the items of noncompliance was considered unacceptable by Region V. The reasons for this non-acceptance were twofold:

1. The time frame to correct the ventilation problem was too long and indefinite.
2. Upon calibrating the effluent monitor with improved techniques, the licensee determined that past calibrations were in error and actual effluent releases were about thirty times higher than previously thought.

Inasmuch as the area containing the stack was not a restricted area, the calibration error meant that the licensee had been exceeding the Technical Specifications and 10 CFR Part 20 limits on gaseous effluents from the stack. Region V summoned the licensee to the regional office for an enforcement conference for the purpose of obtaining commitments from the licensee to bring the facility into immediate compliance with the Technical Specifications. During this meeting the licensee agreed to maintain effluents from the stack to 10 CFR Part 20 concentrations by limiting reactor operations. Because these limitations would result in significant reactor usage cutbacks, the licensee proposed to request an amendment to the technical specification which would allow an increase in the limit for effluent concentrations discharged from the stack. The licensee was instructed to maintain the current emission concentration limitations until favorable action, if appropriate, on the amendment was taken. Implicit in these discussions was the understanding that the licensee would have to justify by detailed analysis that the radiological impact would be acceptable. In the analysis that accompanied the amendment request UCLA indicated that access to the roof area containing the stack is through a locked door with keys available only to maintenance personnel and reactor operations staff.

Limits on discharges of radioactive effluents to unrestricted areas around nuclear facilities are contained in Appendix B, Table II, of 10 CFR Part 20. Section 20.106(b) allows an applicant for a license to propose limits for discharge higher than the values in Table II provided that the applicant demonstrates:

"(1) That the applicant has made a reasonable effort to minimize the radioactivity contained in effluents to unrestricted areas; and

"(2) That it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding limits specified in Appendix B, Table II of this part."

Section 20.106(a) also states that:

"For purposes of this section concentrations may be averaged over a period not greater than one year."

In a letter dated May 22, 1975, UCLA applied for an amendment to its facility operating license for the purpose of rectifying the discrepancy between its actual reactor building ventilation discharge system and the system as described in its technical specifications. A review of the proposed amendment against the provisions of the regulations cited above was undertaken by members of the NRC's Office of Nuclear Reactor Regulation. A request for additional information regarding the proposed amendment was made by the NRC in a letter dated August 14, 1975. UCLA responded to this request by letter dated August 26, 1975. Another supplement to the proposed amendment dated November 5, 1975, was submitted by UCLA in response to questions raised by

the NRC Staff in a telephone call on September 22, 1975. On February 5, 1976, the NRC issued Amendment 10 to the UCLA operating license incorporating the proposed changes to the technical specifications.

In the licensee's submittals, UCLA provided the NRC with sufficient information to enable the Staff to conclude that: (a) the licensee made a reasonable effort to minimize radioactive effluents to unrestricted areas, and (b) there is reasonable assurance that no individual will be exposed to average concentrations of Argon-41 in excess of the maximum permissible concentration (MPC) values.

In its request for Amendment 10, UCLA utilized a reduction factor of 460 for the Argon-41 stack emissions concentration of 1.65×10^{-5} μCi/cc, as measured at the discharge stack. UCLA obtained the value of 460 by considering the fraction of time the reactor operated in a 45-hour week (utilization factor), the Math Science building occupancy factor, and meteorological dilution.

The reactor utilization factor averaged out to 8.4 hours per 45-hour week at 100 kw power equivalent, or 18.8%. UCLA utilized a meteorlogical dispersion factor of 0.115 based upon calculation methods published at that time by the U. S. Atomic Energy Commission*. This reflects the reduction in the concentration of the plume from the stack to the ventilation intake atop the Math Science building. On the basis of building use studies, UCLA assigned a person occupancy factor of 10% (see Appendix A) for the roof of the adjoining Math Science building.

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* Attachment to Concluding Statement of Position of the Regulatory Staff, Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion "As Low as Practicable" for Radioactive Material in Light-Water-Cooled Nuclear Power Reactors. Draft Regulatory Guides for Implementation, February 20, 1974, Docket No. RM-50-2, U. S. Atomic Energy Commission, Washington, D.C. 20545.

The reciprocal of the multiplication of the above three values produced the aforementioned overall dilution factor of 460. This factor is extremely conservative. A more rigorous consideration of all the factors that would serve to dilute the discharge from the stack were not considered at the time by UCLA, possibly because it was recognized that further dilution factors were not necessary in order to be able to operate the reactor at the requisite maximum level of 100 kw for only 8.4 hours per 45-hour week.

In the review of Amendment 10, NRC recognized the conservativeness of UCLA's dilution factor, and issued the license amendment.

On the basis of CBG's allegations, the NRC Staff re-reviewed UCLA's submittal information and the NRC Safety Evaluation Report (SER) to the UCLA Amendment 10. The Staff concluded that the findings of the original SER are still valid. The NRC Staff has performed a more rigorous series of calculations using more current information, techniques and available information, which is included as Appendix A to this decision.

Contrary to the CBG allegation, the NRC did take into account the inside of the Math Science building in granting UCLA its amendment. In the licensee's response of November 5, 1975, the air intakes of all buildings that might draw air from the reactor building stack plume were considered. Although not explicitly discussed in the SER for Amendment 10, the inside of the Math Science building cannot accumulate larger concentrations of the Argon-41 than those that occur on its roof. Therefore, the doses to individuals inside the building are bounded by the doses to individuals on the roof, which were found to be within allowable limits.

In addition to the relatively low environmental radiation exposure values cited above, UCLA is currently installing exhaust air delay tanks which will further decrease the levels of Ar-41 discharged from the facility.

Conclusion

I have determined for the reasons set forth above that there exists no adequate basis for issuing an order to shut down the UCLA research reactor. Accordingly, this portion of the request of CBG is denied.

A copy of this decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c) of the Commission's regulations.

As provided in 10 CFR 2.206(c), this decision will constitute the final action of the Commission twenty days after the date of issuance, unless the Commission on its own motion institutes the review of this decision within that time.

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 24th day of September, 1980

APPENDIX A

CBG Allegation. UCLA stack emissions exceed 10 CFR Part 20 Appendix B Table II for allowable concentrations.

Response. Determination of conformance with 10 CFR Part 20 Appendix B Table II is not made at the emission point. The regulation requires conformance with the allowable concentrations of locations not under the direct control of the licensee that can be occupied by members of the general public. For the UCLA reactor, the location that is used to determine conformance with the regulation is the roof of the Math/Science Building. This location is expected to experience the highest concentration at an uncontrolled point. All other uncontrolled locations would experience lower concentrations.

In order to establish whether the UCLA reactor is in conformance with the maximum permissible concentrations (MPC) of 10 CFR Part 20 Appendix B Table II, the following facts are noted. The primary radionuclide that is released as a consequence of UCLA reactor operation is Argon-41 which has an MPC of 4×10^{-8} μCi/ml. The reactor discharge concentration is 1.65×10^{-5} μCi/ml. Conformance with the regulation is determined by calculating the diluted stack concentration at the roof of the Math/Science Building.

UCLA utilized an acceptable averaging procedure which is summarized below:

a. Reactor Utilization Factor: this was based on 8.4 hours of 100Kw equivalent hours of operation per 45 hour week, or 0.188.

b. Meteorological Dilution Factor: This factor, calculated to be 0.115, was based upon methods prescribed in "Draft Regulatory Guides for Implementation, February 20, 1974, Docket RM-50-2 U.S. Atomic Energy Commission, Washington, D. C. Wind data were obtained from the Los Angeles Air Pollution Control District for a station 2.3 miles south of the UCLA reactor.

c. Occupancy Factor: UCLA, based upon macro-occupancy information for various parts of and functions within the Math/Science building, synthesized an occupany factor of approximately 5%, then doubled it to 10% to account for errors in their information.

Total Reactor Stack Dilution Factor, calculated by UCLA was:

$$\frac{1}{0.188 \times 0.115 \times 0.10} = 460$$

This means that the reactor effluent, which had been measured to be 1.65×10^{-5} μCi/cc at the stack should be divided by 460 to estimate the

average 45 hour week concentration at the air intake located on the Math/Science Building. This concentration is

$$\frac{1.65 \times 10^{-5}}{4.60 \times 10^{2}} = 3.6 \times 10^{-8} \mu Ci/cc$$

UCLA then set the stack monitor alarm at 1.8×10^{-5} μCi/cc. When the alarm sounded this meant that the value in Table II Appendix B of 10 CFR 20 was approached and that the reactor operator should quickly investigate the cause and take appropriate actions.

DISCUSSION OF UCLA APPROACH

The UCLA total reduction factor of 460 was conservative (i.e., the factor could have been substantially greater). More rigorous and acceptable considerations are presented to illustrate the very conservative nature of UCLA calculations used in Amendment 10 submittal in 1975.

Reactor Utilization Factor: The UCLA Reactor Utilization Factor of 0.188 was based upon 8.4 hours of operation per week. UCLA's week was 45 hours. NRC's 10 CFR 20 Appendix B Table II concentrations are based upon a time base of 8760 hours per year. Utilizing the reactor 8.4 hours/week but averaging this operating time over a year provides a Reactor Utilization Factor of .05. This is a reduction of a factor of 20 instead of approximately 6.

Meteorological Reduction Factor: Utilizing balloon releases and more up-to-date wind/cavity calculations, UCLA developed a Meteorological Dilution Factor that was more applicable to the micro-meteorology associated with the geometries of the reactor/Math-Science buildings complex. This factor was 4.67 x 10-3 instead of 0.115. This is a further dilution of 25.

Occupancy Factor. To utilize a probability of 1.0, the occupancy factor is arbitrarily increased to a factor of 100%; i.e., for every hour the reactor operates, a single person is assumed to coincidentally occupy the Math/Science building roof. This is an overly conservative factor but increases the overall factor by 10.

Multiplying these recalculated factors together provides a much lower Total Reduction Factor of: $0.05 \times 4.6 \times 10^{-3} \times 1.0 = 2.3 \times 10^{-4}$.

This means that with the Ar-41 stack emission concentration of 1.65×10^{-5} μCi/cc for the UCLA reactor power level of 100Kw, the Ar-41 concentration on the roof of the Math/Science Building will be less than 3.8×10^{-9} μCi/cc as compared to the MPC for Ar-41 which is 4×10^{-8} μCi/cc.

In order to calculate the dose to an individual exposed on the roof of the Math/Science building, the following factors are included:

Wind Direction. UCLA utilized the wind coming from the same direction for 100% of the time whereas the 10 year wind information indicates the wind direction to be 30% SW and 30% W. If only the SW wind utilized a factor of "three" (3) further dilution is experienced. However a factor of 1 was used.

Dose Factor Correction. The values in Appendix B of 10 CFR 20 for noble gases are calculated based upon an individual being "submerged in an infinite semi-spherical cloud of the airborne material. The fact that the individual is immersed in a much smaller "semi-sphere means that the exposure will be substantially reduced. The curves in Figure 1 which were developed for this condition, indicates that for a radius of 23 meters, 15% of the semi-infinite dose value should be used. [Reference AERE HP/R 1452]

The exposure based upon all of the above assumptions is 1.4 mrem/yr. This dose is less than the "as low as reasonably achievable (ALARA) design objective of 5 mrem/year as stated in 10 CFR Part 50, Appendix I for nuclear power reactors.

Additional Reduction Factor Credits

The Reduction Factor is even less than the above calculated concentration because no credit has been taken for the following conditions which tend to reduce the individual exposure even further:

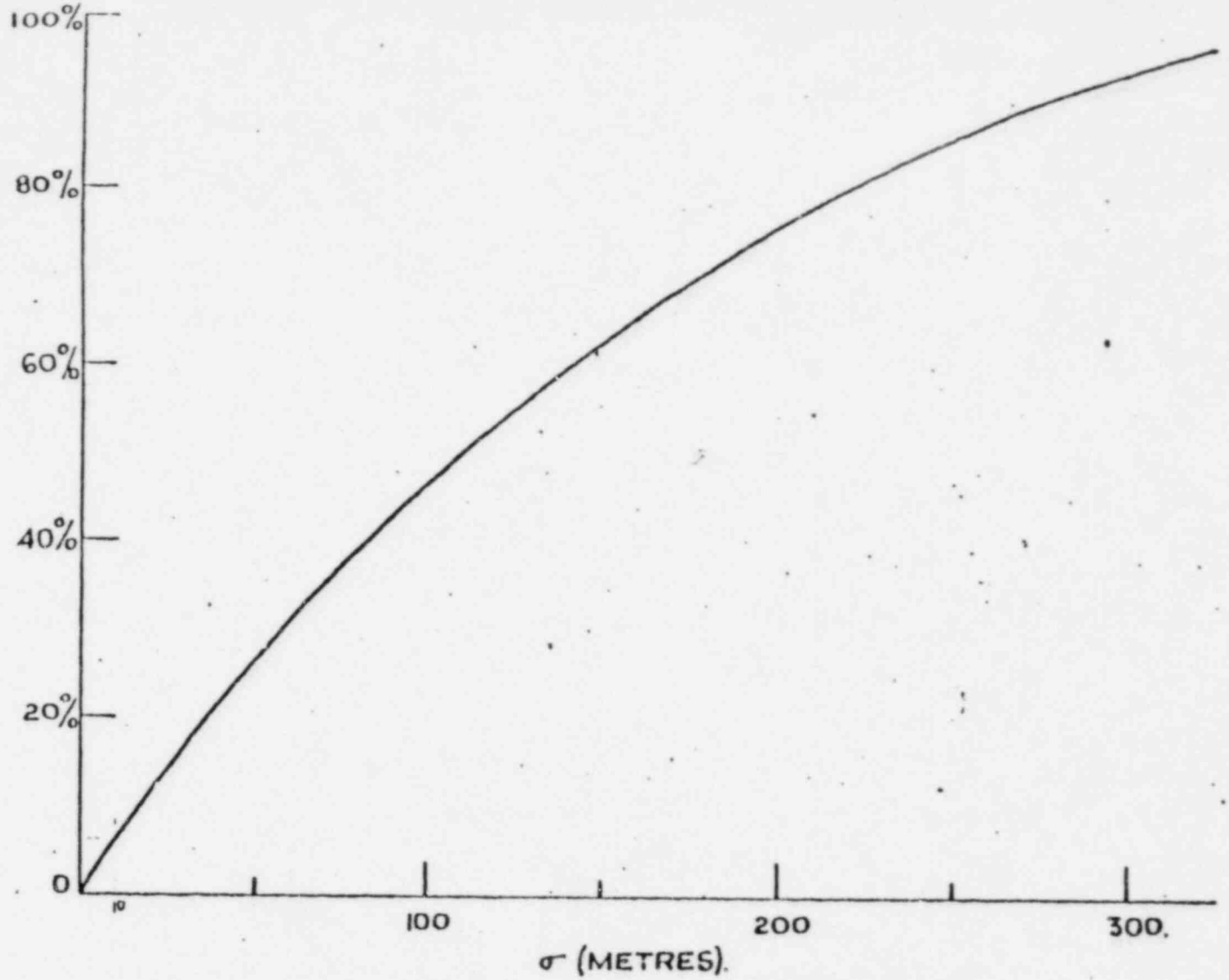
a. Occupancy Factor: It is highly improbable that an individual will occupy a position on the roof of the Math/Science Building for the exact time intervals which the reactor is operating. In all likelihood, therefore, the occupancy factor is substantially less than 100%.

b. Classroom Occupancy: If classroom occupancy is considered [as opposed to roof occupancy], student exposure will be further reduced by the effect of a smaller radius in the considerations of the 10 CFR 20 Appendix II limitation, "...submersion in a semi-spherical infinite cloud of airborne material..."

c. A still further decrease in student exposure should be considered by estimating the amount of outside air that infiltrates into the Math/ Science Building from access, egress and other activities.

These items would provide an additional decrease in concentration of the A-41 by a range estimated to lie between 10 and 1000.

As the calculated concentration and exposure is already 200 times less than allowable, there is no apparent need at this time to obtain a more precise value for the reduction pathways.



A.E.R.E.H P/R.1452. FIG. 21. GAMMA READING ON THE AXIS OF A SYMMETRICAL PLUME AS A PERCENTAGE OF THE "INFINITE ATMOSPHERE" READING.

Fig. 1

NUCLEAR REGULATORY COMMISSION

[Docket No. 50-142]

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

(UCLA Research Reactor)

ISSUANCE OF DIRECTOR'S DECISION UNDER 10 CFR 2.206

By petition dated October 3, 1979, the Committee to Bridge the Gap requested that the NRC issue an order shutting down the UCLA research reactor and take other actions regarding public hearings on renewal of the UCLA operating license. Notice was published in the Federal Register on December 6, 1979, (44 Fed. Reg. 70241) that the petition was under consideration as a request for action under 10 CFR 2.206. Upon consideration of the Committee's petition, I have determined not to shut down the UCLA research reactor. The Committee's request for a hearing and intervention in the UCLA license renewal proceeding are before an Atomic Safety and Licensing Board for appropriate action.

Copies of the "Director's Decision under 10 CFR 2.206" which fully discusses the reasons for this decision are available for inspection in the Commission's Public Document Room at 1717 H Street N.W., Washington, D.C. 20555. A copy of the decision will be filed with the Secretary for the Commission's review in accordance with 10 CFR 2.206(c). As provided in 10 CFR 2.206(c), this decision will constitute the final action of the Commission 20 days after issuance, unless the Commission on its own motion institutes review of the decision within that time.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 24th day of September 1980

COMMITTEE TO BRIDGE THE GAP

1637 BUTLER AVENUE #203
LOS ANGELES, CALIFORNIA 90025
(213) 478-0829 (408) 336-5381

November 4, 1980

Dr. John Ahearne
Acting Chairperson
Nuclear Regulatory Commission
1717 H Street NW
Washington, D.C. 20555

Dear Dr. Ahearne:

We have recently received a copy of a Director's Decision (80-30) which relies upon a statistic we believe to be incorrect; we wish to alert you to facts which contradict it.

On October 3, 1979, we filed a request for a temporary shutdown of the UCLA research reactor pending resolution of certain safety questions related to its emissions of Argon-41. On September 24, 1980, nearly a year later, the Director of the Office of Nuclear Reactor Regulation issued a decision ruling against the request for a precautionary shutdown. Still pending is determination by the Commission whether it wishes to review that Director's Decision.

In coming to its conclusion, the Director's Decision relied upon an estimate of radiation exposure that is 65 times lower than the actual radiation readings cited by the Licensee for the same location and conditions. The estimates employed in the Decision were reached through calculations without reference to a single actual radiation reading. The actual readings contradict the calculational estimates upon which the Director's Decision is based.

Specifically, page 5 of Appendix A of that Decision estimates radiation exposure to be 1.4 mRem/year at the roof of the Math Sciences Building, near the air intake for the building, given 100% occupancy of the roof and maximum permitted operating level for the reactor.

However, the actual TLD readings at that location indicate that for the same conditions assumed in the Director's Decision, the actual measurements indicate "exposures on the order of 90 mRem/yr." above background, according to UCLA's February 28, 1980 Application for License Renewal (pg. V/3-11; emphasis added).

This despite the assertion in the Director's Decision that its estimate of 1.4 mRem/year is probably 10-1000 times too high, and the admission in the UCLA document mentioned above that their readings of 90 mRem/year were achieved only after throwing out a number of TLD readings that were twice as high.

Other actual measurements further contradict the calculated estimate upon which the Director's Decision is based; we would be pleased to provide any further information desired. Our intention here is merely to alert you to information which suggests that the central number upon which the Decision relies--1.4 mRem/yr.--appears to be in error.

Sincerely,

Daniel Hirsch

Daniel Hirsch

cc: Commissioners Bradford, Gilinsky, and Hendrie

7

COMMITTEE TO BRIDGE THE GAP
1637 BUTLER AVENUE #203
LOS ANGELES, CALIFORNIA 90025
(213) 478-0829

(408) 336-5381

1980 NOV 5 PM 3 47

November 4, 1980

Dr. John Ahearne
Acting Chairperson
Nuclear Regulatory Commission
1717 H Street NW
Washington, D.C. 20555

II
Woodhead Gray
Treby ff

Dear Commissioner Ahearne:

Enclosed please find a letter to you regarding a recent Director's Decision which we understand the Commission has until November 7 to determine whether it wishes to review. We wish to alert the Commission to a possible significant error in that Decision.

We would appreciate it if you could distribute to the other Commissioners the enclosed copies.

Sincerely,

Daniel Hirsch

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	)	Docket No.(s) 50-142OL
	)	
	)	
(UCLA Argonaut-Type Research Reactor)	)	
	)	
	)	
	)	

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document(s) upon each person designated on the official service list compiled by the Office of the Secretary of the Commission in this proceeding in accordance with the requirements of Section 2.712 of 10 CFR Part 2 - Rules of Practice, of the Nuclear Regulatory Commission's Rules and Regulations.

Dated at Washington, D.C. this

_____day of _____198__.

_____
Office of the Secretary of the Commission

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	)	Docket No.(s) 50-142OL
	)	
	)	
(UCLA Argonaut-Type Research Reactor)	)	
	)	
	)	
	)	

SERVICE LIST

Elizabeth S. Bowers, Esq., Chairman
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Emmeth A. Luebke
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20 55

Dr. Oscar H. Paris
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Counsel for NRC Staff
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mark S. Pollock, Esq.
Joseph Bradley, Esq.
Pollock & Willis
1724 North La Brea Avenue
Hollywood, California 90046

Dr. Walter Wegst, Director
Research and Occupational Safety
Department of Community Safety
University of California, Los Angeles
405 Hilgrade Avenue
Los Angeles, California 90024

Mr. Daniel Hirsch, President
Committee to Bridge the Gap
1637 Butler Avenue, #203
Los Angeles, California 90025

Donald L. Reidhaar, Esq.
Christine Helwick, Esq.
590 University Hall
2200 University Avenue
Berkeley, California 94720

Mr. John Bay
1633 Franklin Street
Santa Monica, California 90404

CONTENTION VII[1/]

Intervenor has failed to raise a litigable issue in alleging that the UCLA reactor is unreliable since reliability per se is not a safety concern and is, therefore, beyond the purview of the Commission's regulatory responsibility and authority. Thus, the Intervenor's recitation in the Supplemental Contentions (pp. 76-79) of unscheduled shutdowns and maintenance outage are irrelevant to the subject matter of this proceeding. Additionally, it must be remembered that the UCLA facility is a training reactor and that students who are learning reactor control and operation are manipulating the controls, as specifically authorized by 10 C.F.R. § 55.9, and that inadvertent scrams (shutdowns) are to be expected in this situation. This fact is illustrated by Intervenors at p. 76 of the Supplemental Contentions which describes inadvertent scrams due to incorrect operator actions.

As basis for alleging that abnormal occurrences and "accidents" have occurred at the UCLA facility so frequently that the reactor's operation is a risk to public health and safety, the Intervenor cites several "leaks and spills." (Supplemental Contentions p. 77). But discovery questions and responses show that Intervenor cannot show any connection between the "leaks and spills" and public health and safety. (See CBG responses 46(a), 47(d) and 48 to Staff interrogatories) It should be noted that the "accidents" alleged are those "leaks and spills" described in the Supplemental Contentions at page 77.

1/ VII. The reactor has in the past experienced a persistent pattern of numerous unscheduled shutdowns, abnormal occurrences, and accidents. These occurrences are so pervasive that they evince a pattern of unreliability which makes it impossible for Applicant to reasonably assure that the reactor can be operated in a manner which does not endanger the public health and safety.

As can be seen from the events labeled "accidents," the term is used to describe minor matters requiring maintenance and repair but has no safety significance.

The only evidence which Intervenor could present at hearing in support of this contention is the UCLA annual reports to the Commission and the I&E reports. (CBG Responses 47(c) and 48(b) to Staff interrogatories and CBG responses 31-34 to Applicant's interrogatories).

The attached affidavit of NRC Inspector Philip Morrill attests to the fact that his recent personal inspections of the UCLA facility and its records as well as his review of UCLA Annual Reports 1976-79; descriptions of three "Abnormal Occurrences", 1978 - 1981; and NRC inspection reports 1975 - 1981 showed no "pattern" of unreliability or occurrences and that no accidents have occurred which caused damage to property or harm to individuals. (Morrill affidavit pp. 1-2). Further, as pointed out by Mr. Morrill, all "abnormal occurrences and unscheduled shutdowns" have been the subject of inspection by Region V of the Office of Inspection and Enforcement (Id. p. 2, para. 6), and none of the events enumerated in this contention indicate a risk to public safety by continued operation of the UCLA facility. (Id. para. 7). (See also affidavits of Inspectors Young, Johnson, and Wenslawski concerning Contentions III, IV and IX).

Therefore, since the only evidence Intervenor could provide to support this contention is the licensee's annual reports and I&E reports; and since the Intervenor's discovery responses show that none of the events referenced are related to health and safety; and since the affidavit of NRC Inspector Morrill attests to the minor significance of the events described as

"unscheduled shutdowns, abnormal occurrences and accidents" and the corrective actions taken by UCLA, the Staff submits that there is no factual basis to support this contention. The facts cited by Intervenor are not in dispute among the parties, but the events cited raise no safety issue or issue of material fact to require litigation. Rather, the contention mischaracterizes facts of record. For the above reasons, the Staff submits that contention VII must be summarily disposed in its entirety.

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)
	)	
(UCLA Research Reactor)	)	

AFFIDAVIT OF PHILIP MORRILL

STATE OF CALIFORNIA)
COUNTY OF CONTRA COSTA) SS

I, Philip Morrill, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Inspection and Enforcement, Region V, Walnut Creek, California. My professional qualifications are attached.

2. I, along with Mr. Tolbert Young Jr., performed a routine inspection at the UCLA facility on June 24-26, 1981. The inspection covered the period from March, 1980 through June 1981. The inspection included an examination of maintenance records, calibration records, log books, radiation use committee minutes, procedures, records of experiments and the requalification training program records. We found no violations of the technical specifications, regulations or license conditions during the inspection.

3. I also performed a routine inspection at the UCLA facility on February 21-23, 1979. The inspection covered the period from January, 1978 through February, 1979. The inspection included an examination of logs and records, review and audit, requalification training, procedures, surveillance, experiments, followup of a reportable item and independent effort including a tour of the facility and witnessing of an experiment. I found no violations of the technical specifications, regulations or license conditions during the inspection.

4. I have read the following documents relative to the UCLA Research Reactor:

   Annual Reports for the years 1976, 1977, 1978 & 1979
   Description of "Abnormal Ocurrances" which occurred on January 30, 1978, December 19, 1979 and January 20, 1981.
   USNRC Inspection Reports for December 1975, October 1976, January 1977, January 1978, February 1978, October 1978, February 1979, September 1979, February 1980, November 1980 and June 1981. Licensee Responses to items of noncompliance Identified in USNRC Inspection Reports for January 1977, and February 1980.

5. I have read contention VII admitted by the Atomic Safety and Licensing Board. Contrary to the contention, it is my professional opinion, based on my observations during my inspection, my discussions with the UCLA Research Reactor Staff, and my examination of the written material described above, that (1) there is no persistent pattern of unscheduled shutdowns, abnormal occurrences, or accidents, and (2) the events which have occurred are neither pervasive nor evidence a pattern of unreliability. During the period January 1, 1976 through June 1, 1981, there were a total of 4 reportable events ("abnormal occurrences" per UCLA Technical Specifications). Nine unscheduled shutdowns occurred in 1976, three in 1977, five in 1978 and one in 1979. There have been no accidents causing damage to property or harm to individuals at the UCLA Research Reactor.

6. The causes of and corrective actions taken for "abnormal occurrences" and unscheduled shutdowns have been routinely inspected by the NRC Region V inspection staff. In all but one case since January 1, 1976, the corrective actions were judged adequate. In that one case, identified during a February 1980 inspection, the licensee was issued a notice of violation for not having an emergency procedure for operator action following a dropped control rod. Other than a decrease in reactor power there were no adverse consequences of this event. The lack of a dropped rod procedure, in my opinion, is of minor safety significance. The February 1980 inspection did not identify any safety problems or followup actions the licensee should have taken. During the "abnormal occurrences" and unscheduled shutdowns the reactor protection system functioned as designed to place the reactor in a safe condition.

7. Based on the UCLA Research Reactor Staff's performance as well as the small number and minor significance of unscheduled shutdowns, abnormal occurrences, and accidents over the last five years, it is my opinion that the reactor can be operated in a manner which does not endanger the public health or safety.

8. I have read contention IX admitted by the Atomic Safety and Licensing Board. Contrary to the contention, it is my professional opinion, based on my observations during my inspections, my discussions with the UCLA Research Reactor Staff, and my examination of the written material described in paragraph 4 above, that the applicant has calibrated instruments at the required intervals since January 1, 1976, the licensee's personnel are familiar with the calibration requirements of their own technical specifications, records of maintenance and calibration are maintained at the facility, and the performance of heat balances, calibrations, and maintenance have been adequate.

9. In regards to calibrations, during the February 1980 inspection of the UCLA Research Reactor an apparent item of non-compliance was identified in that "the neutron channels were not calibrated between December 8, 1978, and January 9, 1980, a period in excess of 13 months". The technical specifications state "The neutron channels shall be calibrated against an independent measure of core power at intervals not exceeding 12 months". Normally standardized technical specification permit a 25% plus or minus grace period for routine calibrations. This provision is contained in the proposed technical specifications for the UCLA Research Reactor. Since January 1, 1976, the licensee's records show that UCLA Research Reactor Staff have completed six heat balances, ten electrical alignments of the "Log N" neutron channel, seven electrical alignments of the "Linear" neutron channel, and nine electrical alignments of the "safety" neutron channels. The longest interval between calibrations which was observed is the one cited above (ie: December 8, 1978 to January 9, 1980), a period of 13 months and one day.

10. It is my opinion based on the inspection history, licensee records, and my own inspections over the last five years that the licensee has adequately maintained equipment and calibrated instruments and that the health and safety of the public will not be adversely affected by continued operation of the reactor under the present conditions.

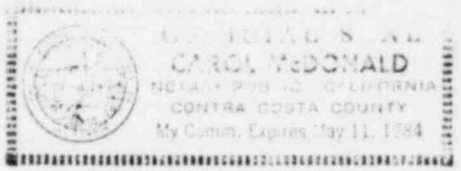
11. I have read the Declarations of Allen D. Johnson, Frank Wenslawski and Tolbert Young Jr. submitted in these proceeding and concur with the opinions and conclusions stated in each of the declarations.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Philip Morrill

Philip Morrill

Subscribed and sworn to before me
this 10 day of July, 1981



Carol McDonald

Notary Public

My Commission expires:

PHILIP J. MORRILL
PROFESSIONAL QUALIFICATIONS
REGION V - WALNUT CREEK, CALIFORNIA
OFFICE OF INSPECTION AND ENFORCEMENT

My name is Philip J. Morrill. I am employed by the United States Nuclear Regulatory Commission as a reactor inspector in the Reactor Operations and Nuclear Support Branch, Office of Inspection and Enforcement, Region V, Walnut Creek, California. My primary responsibility in this position is the inspection of nuclear power plants during the operating phase to determine compliance with NRC rules and regulations.

I received a Bachelor of Science degree from the U.S. Naval Academy in 1966. I was employed by the U.S. Navy in the Naval Nuclear Power Submarine program from 1966 until 1971. During this time, I became qualified as Engineering Officer of the Watch for the AIW pressurized water nuclear propulsion plant prototype and was later qualified as Engineering Officer of the Watch on board the USS John Marshall (SSBN 611 (G)), a nuclear powered polaris missile submarine (1969 through 1971). I was also the ship's Main Propulsion Assistant (responsible for maintenance and administration of the nuclear reactor and power generation equipment) for one and one-half years of this time. In 1971, I joined the Bechtel Corporation in San Francisco, California and was assigned to the Susquehanna Steam Electric Station project mechanical group. From August 1971 through September 1972, I was responsible for the design and development of the radioactive waste disposal system. From September 1972 through January 1974, I was assigned duties of the project licensing engineer. From January 1974 through March 1976, I was the project nuclear group leader responsible for managing and supervising the efforts of 8 to 10 engineers.

In March 1976, I was hired by the U.S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, Region V, in Walnut Creek, California, as a reactor inspector for the Reactor Construction and Engineering Support Branch. In this position, I participated in several construction inspections of the San Onofre Nuclear Generating Station and successfully completed a nondestructive examination school at Convair Division of General Dynamics. (San Diego, California), as well as a quality assurance and inspection course in Bethesda, Maryland. In January 1977, I transferred to the Reactor Operations and Nuclear Support Branch of Region V, Office of Inspection and Enforcement and was assigned as back-up inspector for the Trojan Nuclear Plant. In succeeding months I participated in inspections of the Rancho Seco, Humboldt, and Trojan nuclear plants in addition to completing five weeks of pressurized water reactor systems and operations training. For about one year I was then assigned as principal inspector for the Trojan Plant. In the fall of 1978, my assignment was again changed to follow-up the preoperational testing of the Diablo Canyon Nuclear plant. Although these have been my principal assignments, I have participated in a variety of research and power reactor inspections and investigations during the last three years.

I am presently a registered Professional Mechanical Engineer and Nuclear Engineer in the State of California.

CONTENTION VIII[1/]

By amendment submitted June 23, 1982, the Applicant withdrew the entire hazards analysis in Appendix III and replaced it with another, recently performed analysis, based on two generic studies of Argonauts by Battelle and LANL. Consequently, the previous hazards analysis is not now presented as a basis for license renewal. The Intervenor's contention continues to contest the withdrawn Hazards Analysis even though provided the opportunity to revise the contention to address the present application's hazard analysis.[2/] Thus, there is now no relation between this contention (which attacks the credibility of the withdrawn analysis) and the present application, which rests on different analysis. Therefore, the contention must be dismissed for failure to raise a litigable issue.

[1/] VIII. Radiation exposure to the public from the maximum credible accident at the UCLA reactor would be unacceptably high. Specifically,

1. the 1980 Safety Analysis Report and 1960 Hazards Analysis, despite being based on unrealistic assumptions which minimize the expected public exposure, postulate an unacceptably high radiation dosage of 1800 Rems thyroid. The insufficiently conservative assumptions are:
   a. assumption of a release limited to only 10% of the volatile fission products and none of the non-volatile products,
   b. assumption that the reactor has been operated at 10 kw long enough to have attained equilibrium concentrations of relatively short-lived fission products,
   c. assumption that the reactor is in a two-story building with possible exposure to the public occurring outside the building,
   d. assumption of a building leakage rate of 20% of the reactor room volume per hour for a 30 mile per hour wind, assumed to be directly proportional to wind velocity;
   e. furthermore, the assumptions upon which the analysis was based have not been adequately tested nor have they been adequately reviewed against the current nuclear safety literature regarding dose and dispersion models.

[2/] Tr. 750-57. (Prehearing Conference, June 1982).

As demonstrated by the attached affidavit of Millard Wohl, a fuel melt cannot occur in an Argonaut reactor because of its design and operating characteristics. (Wohl, p. 2, para. 5). No credible accident at an Argonaut could produce significant fission product releases or radiation doses. (Wohl, p. 2, para. 4 & 6).[3/]

The maximum credible accident analyzed by Staff (SER pp. 14-8 to 14-10) assumed a collapse of the entire eight stories of Boelter Hall onto the UCLA reactor resulting in destruction of the concrete shield, loss of coolant, and a crushed core with damage equivalent to 750 guillotine breaks in the fuel plates. Additionally, it was assumed that the reactor was operating at full 100 kw power and long enough to reach fission product equilibrium, and that the fission products were dispersed. The doses derived from this analysis

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3/ It should be noted that Intervenor asserts in Contention VIII that the withdrawn 1960/1980 accident analysis is flawed because the underlying assumptions in the analysis are unrealistically low and that, therefore, the dose calculations are unrealistically low. The truth is exactly the opposite. Intervenor fails to note the most important of the assumptions underlying the withdrawn accident analysis, namely, that a core melt is assumed, even though such an event is not credible as stated in the hazards analysis. Thus, the previous safety analysis in the application is that of an incredible accident. The recent laboratory analysis by Battelle and LANL as well as that by UCLA submitted by amendment deal with credible accidents at Argonauts, which, apparently, Intervenor does not challenge.

The 1960/1980 Hazards Analysis explained (on p. III/B-1) that:

> Although such an event is not considered even plausible because of the limitations on available excess reactivity and because of the inherent self-limiting characteristics of the reactor, it is postulated that an accident has occurred in which the reactor power level has risen to the extent that local melting of the fuel plates has occurred.

(30 rem thyroid and 1.4 rem whole body) were within 10 CFR § 20 and small fractions of 10 CFR § 100 accident guidelines. (SER p. 14-10). The Staff's accident analysis rests entirely on extremely conservative assumptions. (Wohl, p. 2, para. 6, 7). Thus, the Intervenor's assertion that the 1960-80 hazard analysis is flawed is quite correct. That analysis postulates an accident which is incredible. The fuel handling accident substituted by the June 1982 amendments to the application, designated the maximum credible accident, does not indicate significant releases so as to threaten public health and safety. (Amended Application, Table III/8-2). Additionally, Applicant demonstrates the sound conservatism underlying the Battelle and LANL studies. (Application, pp. III/8-3 to 8-8). The two generic studies of postulated credible accidents in Argonaut UTR's recently produced by two of the Commission's consulting laboratories, demonstrate the impossibility of fuel/clad melting in an Argonaut[4/] and show that the worst consequences from any of the several credible accidents analyzed, would pose no risk to the public health and safty.

Finally, the basis alleged for this contention has been removed from the application, as previously discussed.

By letter of October 14, 1981 (W. Wegst to J. Miller), and by formal amendment of June 23, 1982, UCLA withdrew Attachments A and B to Appendix III as well as the proposed technical specifications contained in the application for license renewal. As indicated there, the Applicant incorporates by reference the two generic analyses of postulated accidents in Argonaut reactors (NUREGS/CR-2079 and CR/2198) into the application as basis for the safety analysis performed by UCLA.

4/ NUREG/CR-2079 and NUREG/CR-2198 supra, p. 10.

Consequently, for the above reasons, there is no material issue of fact underlying this contention since it is clear that the application's postulated accident is based on sound scientific evidence and methodology.

Therefore, since no material issue of fact underlies this contention and since the hazards analysis referenced is not now part of the application, and because the generic laboratory studies and the recent (June 23, 1982) analysis by UCLA amply demonstrate that no credible accident at the UCLA reactor would result in radiological releases which would pose a risk to the public, the Staff submits that Contention VIII must be dismissed as a matter of law.

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)	)	

AFFIDAVIT OF MILLARD L. WOHL
REGARDING CONTENTION VIII

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Millard L. Wohl, being duly sworn do depose and state as follows:

1. I am a Nuclear Engineer employed by the Nuclear Regulatory Commission in the Accident Evaluation Branch of the Division of Systems Integration in the Office of Nuclear Reactor Regulation. A statement of my professional qualifications is attached to this affidavit.

2. As part of my duties, I have reviewed the Applicant's Safety Analysis Report. I assisted in the preparation of the Office of Nuclear Reactor Regulation's safety evaluation of June 1981. This affidavit responds to Contention VIII of the Committee to Bridge the Gap.

3. In order to conservatively bound the consequences of fuel-damage accident scenarios, the staff defined an accident described by large compromise of the fuel clad. The short-term radiological consequences just external to the building wall resulting from a clad-compromising accident were a small fraction of the guidelines of 10 CFR Part 100 (even though these guidelines are not intended for research reactors). These consequences would bound those resulting from fuel clad damage in a seismic event or other potentially core-disruptive accidents.

4. There is no credible series of events or mechanisms by which volatile fission products could be released from the core and lead to significant radiological consequences to the public. Neither a sudden reactivity insertion of $3.00 (Technical Specification Limit, Staff SER, June 1981, p.15-7) nor a clad-compromising event, including a seismically-induced core disruptive event could lead to fuel clad melt with concomitant

release of significant amounts of the volatile fission products.

5. As determined in NUREG/CR-2079 (Hawley, S.C., Kathren, R.L., and Robkin, M.A., Analysis of Credible Accidents for Argonaut Reactors, April 1981), even for a very rapid insertion of 2.6% Δ k/k (corresponding to about $3.90) the maximum energy release would be 12 Mw-sec with a prompt period of 7.2 msec. Inasmuch as the maximum reactivity insertion, by Technical Specification limit, is 2.0%Δk/k ($3.00). The peak clad temperature is far below the clad melting point, thus melting will not result.

6. As stated on page 14-10 of the Staff Safety Evaluation Report of June 1981, the thyroid dose at the reactor room wall due to seismically-induced core disruption (maximum credible consequences) is about 30 Rem, a small fraction of the 10 CFR Part 100 limits. Since the radiological inventory was assumed to be from 36.5 MWd of operation at 100 Kw, the actual volatile fission product inventory would be substantially less than that assumed in the 30 Rem determination. Additionally, no plateout credit was taken, and the meteorological relative concentration to which the dose is proportional, of 7×10^{-3} sec/m^3 used (Sagendorf, J.F. et al., Diffusion Near Buildings as Determined From Atmoshperic Tracer Experiments, NOAA Technical Memorandum ERL APL-84, April 1980) is an appropriate upper bound of the largest such parameter ever measured close to buildings.

7. Even though the reactor is housed in a two-story building, the seismically-induced accident discussed by the Staff in its safety evaluation of June 1981 assumes non-survival of the building, a highly conservative assumption. Since no credit was taken for fission product retention or plateout, any assumed building leak rate is irrelevant, since the staff assumed instantaneous dispersal of released fission products in a semi-infinite cloud configuration, much more conservative assumptions than any made by the applicant in the Argonaut Safety Analysis Report for the University of California at Los Angeles Training Reactor.

8. In conclusion, it is my opinion that there is no credible accident scenario that can result in radiological consequences detrimental to the public health and safety. The Committee to Bridge the Gap has not raised any issues which would lead me to alter my opinion.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Millard Wohl

Subscribed and sworn to before me
this _____ day of _____, 1981

_____
Notary Public

My Commission expires:

MILLARD L. WOHL
PROFESSIONAL QUALIFICATIONS

I am employed as a nuclear engineer in the Accident Evaluation Branch, Division of Systems Integration, U.S. Nuclear Regulatory Commission, Washington, DC. My duties are to conduct site and accident analyses and various other safety-related studies for nuclear power and non-power reactor facilities. I was the contract monitor for the Pacific Northwest Laboratory work leading to NUREG/CR-2079, Analysis of Credible Accidents for Argonaut Reactors and the Los Alamos National Laboratory work leading to NUREG/CR-2198, Fixed Temperatures in an Argonaut Reactor Core Following a Hypothetical Design Basis Accident (DBA).

I attended Case Western Reserve University (formerly Case Institute of Technology) and received a B.S. degree in Physics in 1956. I received an M.S. degree in Physics from Indiana University in 1958. I did graduate work in Nuclear Engineering at Columbia University and Case Western Reserve University from 1962 through 1964. I was a teaching assistant in Physics at Indiana University from 1956 - 1958. I have taught physics and mathematics in the evening divisions of Baldwin-Wallace College, the Ohio State University and Cuyahoga Community College from 1958 - 1973.

In 1958, I joined the NASA Lewis Research Center in Cleveland, Ohio. My initial duties involved the writing of Monte Carlo computer codes for the determination of radiation shielding requirements and propellant heating for proposed nuclear-powered rocket designs. Other assignments involved methods development and shielding and nuclear safety analyses for numerous proposed mobile nuclear vehicle applications. Numerous technical publications evolved in the course of this work. Additionally, during the period 1958 - 1973, I had substantial research contract management responsibilities.

In 1973, I joined the General Atomic Company in La Jolla, California, as a nuclear engineer. At General Atomic I performed a variety of nuclear safety-related analyses for the High-Temperature Gas-Cooled Reactor (HTGR). These included the analysis of depressurization accidents and containment integrity studies, as well as computer code upgrading and modification.

In 1975, I joined the Accident Analysis Branch in the Division of Technical Review, U.S. Nuclear Regulatory Commission. My responsibilities involved site characteristic studies and accident analyses. Presently, I have similar but expanded responsibilities.

CONTENTION IX[1/]

The bases cited in support of this contention are three I&E reports from 1968, 1974, and 1975 and the Application, p.II/1-5 (Supplemental Contentions pp. 87-91). The primary emphasis of Intervenor's basis is the 1975 I&E report which cites the UCLA failure to calibrate the reactor room area radiation monitors and gaseous effluent monitor at the frequency required by the technical specifications. The reference made to the application by Intervenor points out the application's statement at p. III/1-5 that one hour of the year was devoted to maintenance, which the Intervenor states is insufficient.

Discovery ascertained that the only evidence Intervenor could provide in support of this contention are the above cited references and I&E report 80-02 (citing the lack of emergency procedures for operator action for a dropped rod

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1/ IX. The Applicant in the past has not adequately maintained its equipment nor calibrated its instruments properly, thereby increasing the chances of equipment failures and erroneous instrument reading. Due to this failure, the NRC cannot conclude that the issuance of a license for this facility will not be inimical to the public health and safety. Specifically:

1. Applicant has failed to calibrate instruments at the required intervals.
2. Applicant's personnel are not familiar with the calibration requirements of their own technical specifications.
3. Applicant has failed to maintain, or has lost, calibration records, making accurate calibrations and data interpretation impossible.
4. Applicant has significantly underestimated radioactive emissions for extensive periods of time due to errors in its calibration methods.
5. Applicant has had continuing problems with heat balance calibrations.
6. Applicant has not devoted adequate time to maintenance and calibrations.

and failure to calibrate neutron channels within the 12 months required by present technical specifications) and I&E report 80-03 (which states no items of non-compliance were identified in the November, 1980 twenty-two hour inspection). (CBG response to Staff interrogatory 56). Intervenor response to Staff interrogatory 57 provides no definition of Intervenor's idea of "adequate" time for maintenance but only a challenge to the time spent by UCLA as inadequate, thus providing no basis at all for this allegation. CBG response 56(d) alleges that I&E report 80-03 is evidence that the 1975 calibration errors have not been rectified, whereas I&E report 80-03, p. 2, para. 5 describes the UCLA investigation by the University staff between effluent measurements at two locations. There is no reference to any error in calibration. Intervenor misquoted the I&E report.

Contrary to the assertions above, the attached affidavit of NRC Inspector Frank A. Wenslawski, who discovered and cited UCLA for the 1975 calibration error, explains that this error has been corrected; that it was not a serious matter of excessive emissions and has been continually checked by inspectors from Region V of OIE at each routine inspection since that date, and that no further such calibration failures have occurred. (Wenslawski affidavit, pp. 1-2). Additionally, Inspector Wenslawski notes that the recent effluent measurement discrepancy was discovered by and investigated at the University's own initiative even though the discrepancy did not involve a concern affecting effluent limits. (Wenslawski, p.2, para. 7).

The most recent inspection by Mr. Wenslawski and I&E inspectors is attached. The report cites the University for failure to have written procedures for instrument calibration. The response of UCLA which has instituted written procedures is also attached.

Inspector Philip Morrill attests that his personal inspections of the UCLA facility and his review of UCLA and NRC records show that maintenance and calibration of equipment and instruments by UCLA staff has been adequate and there is no risk to public health and safety from inadequate maintenance by UCLA. (Morrill affidavit attached to discussion of contention VII, p. 3). Additionally, Inspector Morrill explains that standard reactor technical specifications allow a 25% grace period for "annual" calibrations so that although it was a violation of the UCLA technical specifications to omit calibration within 12 months (in 1976) it was not a serious matter, and that since 1976 UCLA has properly performed heat balance and other calibrations. (Morrill, p. 2, para. 9).

Intervenor can provide only the referenced I&E reports in support of this contention, but two inspectors attest through their personal knowledge of the matters discussed in the referenced I&E reports that equipment and instrument calibration at UCLA is sufficient to protect public health and safety; that the 1975 calibration error has been satisfactorily corrected and that the University staff has shown responsibility in seeking accurate effluent measurements. Additionally, the affidavits of NRC inspectors Young and Johnson (attached to discussion of Contentions III and IV) state their general view of proper performance by UCLA. Therefore, the Staff submits that there is no issue of material fact to be litigated concerning this contention and that Intervenor's whole basis consists of a mischaracterization of inspection records by failing to note corrective actions taken by the University and verified by the Commission's inspectors, and by asserting that minor matters are significant. For these reasons the Staff believes the Board must dismiss Contention IX as a matter of law.

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)
(UCLA Research Reactor)	)	

AFFIDAVIT OF FRANK A. WENSLAWSKI

STATE OF CALIFORNIA)
COUNTY OF CONTRA COSTA) SS

I, Frank A. Wenslawski, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Region V Office of Inspection and Enforcement, Division of Technical Inspection, Radiological Safety Branch. My professional qualifications are attached.

2. I am Chief, Reactor Radiation Protection Section and have responsibility to direct the regional inspection program in the areas of radiological safety, environmental protection, emergency planning and radioactive waste management at nuclear power plants, and research and test reactors.

3. I have personally inspected the UCLA research reactor and specifically examined the adequacy of the licensee's calibration of certain radiation and radioactive effluent monitoring instrumentation.

4. Since November, 1977, I have been the direct supervisor of other radiation specialist inspectors who have inspected the UCLA research reactor.

5. I have read contention IX admitted by the Atomic Safety and Licensing Board and do not agree with its allegation. I attest to the following information to support this statement:

   a. In support of contention IX, the Committee to Bridge the Gap's "Supplemental Contentions to Petition For Leave to Intervene" makes several references to Inspection Report 050-142/75-01. I was the inspector responsible for that report and therefore have first-hand knowledge of its contents. This inspection was conducted in

January, 1975. At the time of that inspection, noncompliance was identified for exceeding the six month calibration interval for two area radiation monitors and the gaseous effluent monitor. In discussion with the reactor supervisor at that time, this individual was mistakenly of the impression that these monitors were on the same annual calibration frequency as the nuclear instrumentation and annual calibrations were being performed. The licensee was cited for noncompliance with the facility Technical Specifications and took corrective action as identified in his March 13, 1975 letter to the Region V office. Since that time, the Region V office has conducted five additional radiation protection oriented inspections at UCLA. These were in October, 1976; February, 1978; February, 1979; September, 1979; and November, 1980. During these inspections, the subject of calibration of effluent and radiation monitoring instrumentation was routinely examined as required by inspection procedures. None of these inspections identified any further noncompliance with maintenance or calibration requirements for radiation protection instrumentation.

b. It should be additionally noted that at the time of the 1975 inspection, the licensee had not been ignoring the calibration of the effluent monitor. Although he was three months overdue for an official calibration, calibration studies had been performed prior to the inspection in an attempt to generate the most accurate information. These studies eventually identified an error in previous calibrations which revealed the underestimated radioactive emmissions referenced by the intervenor in this contention. It was through the licensee's own initiative that this error was identified, quantified and corrected. Although the corrected data identified higher releases of radioactive effluent (Ar-41), these releases did not pose a threat to public health and safety.

c. In the most recent of the aforementioned inspections, November, 1980, Report No. 50-142/80-03, it was learned that the licensee had taken further initiative to define measurements of gaseous effluents from the facility. This effort entails the comparison of measurements made by the stack gas monitoring instrumentation with special grab samples of the stack gas. At the time of the inspection, a discrepancy existed between the two different types of measurements and the licensee was working to resolve this. The discrepancy was not of such significance to affect limitations on gaseous effluents. The intervenor CBG references this report in response to the Staff's interrogatory 56(b) dated 4/20/81 to support contention IX, but in my opinion this situation demonstrates the licensee's deliberate and capable effort beyond regulatory requirements to refine instrumentation measurements to the maximum extent and represents the licensee's fundamental concern for the public health and safety.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Frank A. Wenslawski

Subscribed and sworn to before me
this 2 day of July, 1981

Carol McDonald
Notary Public

My Commission expires: May 11, 1984

OFFICIAL SEAL
CAROL McDONALD
NOTARY PUBLIC CALIFORNIA
CONTRA COSTA COUNTY
My Comm. Expires May 11, 1984

FRANK A WENSLAWSKI

Professional Qualifications

My name is Frank A. Wenslawski. I am Chief, Reactor Radiation Protection Section in the Radiological Safety Branch, Office of Inspection and Enforcement, Region V, Walnut Creek, California. I am responsible for directing a program of inspections of radiological safety, environmental protection, emergency planning and radioactive waste management at nuclear power plants, and research and test reactors within the Region.

I was born in Blackwood Terrace, New Jersey. I attended Rutgers University, College of South Jersey and graduated with a BA degree in physics in 1965. I served as an officer in the U.S. Navy from November 1965 to November 1968. While in the Navy I received specialized training in radiological health techniques and was assigned to a nuclear submarine tender as the radiation health officer. After a tour of duty on the ship, I was transferred to the Naval Radiological Defense Laboratory where I assisted in the development of passive radiation dosimetric devices.

Upon discharge from the Navy, I was employed as a health physicist at Mare Island Naval Shipyard where my duties involved radiation protection for activities associated with the overhaul and refueling of nuclear powered submarines and surface vessels. While at Mare Island I was subsequently promoted to the position of Senior Shift Radiological Control Director and then to the position of Chief, Operational Health Physics Branch.

In late 1972, I left Mare Island for employment with the U.S. Atomic Energy Commission as a health physicist in the Radiological Assessment Branch, Directorate of Licensing. I was responsible for assisting in the evaluation of reactor facilities and reactor sites with respect to radiation safety and radiological environmental effects. My duties included performing technical reviews, analyses and evaluations of Safety Analysis Reports and Environmental Reports in support of AEC licensing functions.

In mid-1974 I transferred witnin the Atomic Energy Commission to the Region V Office where I became a radiation specialist inspector. My responsibility in that capacity included inspection and investigation of radiological safety aspects of power reactor facilities, research and test reactors, and all types of materials users including medical, industrial and academic facilities. These duties included ascertaining the adequacy of radiation safety programs at licensed facilities as well as verification that activities were conducted in accordance with the rules and regulations of the Commission. In late 1977 I was promoted to my current position.

I have been a plenary member of the Health Physics Society since 1969.

JUL 7 1982

Docket No. 50-142

University of California at Los Angeles
Los Angeles, California 90024

Attention: Mr. Walter F. Wegst, Ph.D
Director, Office of Research and
Occupational Safety

Gentlemen:

Thank you for your letter dated June 24, 1982 informing us of the steps you have taken to correct the items which we brought to your attention in our letter dated June 9, 1982. Your corrective actions will be verified during a future inspection.

Your cooperation with us is appreciated.

Sincerely,

Original signed by
H. E. Book

H. E. Book, Chief
Radiological Safety Branch

UNIVERSITY OF CALIFORNIA, LOS ANGELES

UCLA

BERKELEY · DAVIS · IRVINE · LOS ANGELES · RIVERSIDE · SAN DIEGO · SAN FRANCISCO

SANTA BARBARA · SANTA CRUZ

COMMUNITY SAFETY DEPARTMENT
OFFICE OF RESEARCH & OCCUPATIONAL SAFETY
LOS ANGELES, CALIFORNIA 90024

June 24, 1982

F.A. Wenslawski
Chief, Reactor Radiation Protection Section
USNRC
Region V
1450 Maria Lane, Suite 260
Walnut Creek, California 94596

Docket No. 50-142

Dear Mr. Wenslawski:

Re: NRC Inspection of UCLA Research Reactor - Notice of Violation

The following actions have been taken to correct the two violations cited in your letter of June 9, 1982.

A. A draft procedure for calibration of portable radiation safety instruments has been written and will be tested within the next month. If any revisions are found to be necessary the draft will be rewritten accordingly, at which time it will be incorporated into written procedures for the NEL. The NEL Director and the Radiation Use Committee will be given an opportunity to review this procedure even though it is actually a campus wide procedure which will be used at the NEL.

   The Director of the NEL has not reviewed the Area Radiation Monitor calibration procedure, because the matter was passed directly to the Radiation Use Committee (see B below).

B. The Radiation Use Committee met on June 15, 1982 and reviewed the calibration procedure for the Area Radiation Monitors. The Committee suggested a number of changes and additions to the procedure, which is currently being re-written. When the revised procedure is completed, it will be tested in July and if found to be satisfactory it will again be presented to both the Director of NEL and the Radiation Use Committee for their respective review and approval.

We wish to note that the Technical Specifications for the UCLA Reactor do not explicitly refer to calibration procedures and previous inspection reports have not referred to the need for such written procedures (nor have previous inspectors informally implied such a requirement). We do not dispute the need for written calibration procedures and in fact our 1981 in-depth review

made that point. As a result, we initiated a procedure-writing activity some twelve months ago, that is not yet finished. However, as we discussed with the inspectors during the exit interview, we do not agree that we are in technical violation of our license.

We also wish to comment briefly on the observations made by Messrs. Cillis and Garcia relative to the performance of the reactor health physicist. Due to the unexpected resignation of the previous health physicist in 1981, the encumbent was reassigned to this position from another assignment on the campus. He has now been in this job slightly more than one year. The Director of the Office of Research and Occupational Safety and the Campus Radiation Safety Officer both recognized some 6-8 months ago that the performance of this individual was less than adequate. As a result, various steps had been initiated prior to the inspection to begin to upgrade the performance of this individual. On the job training was started, the reactor health physicist was assigned to take the reactor operator training course (he recently achieved a 'B' on the final exam), and certain disciplinary action was taken against the individual. Management intends to continue to work very closely with the reactor health physicist and to take whatever steps are necessary to achieve satisfactory health physics coverage at the reactor.

Very Truly Yours,

Walter F. Wegst

Walter F. Wegst
Director, Research &
Occupational Safety

WFW/gr

JUN 9 1982

Docket No. 50-142

University of California at Los Angeles
Los Angeles, California 90024

Attention: Walter F. Wegst, PhD
Director, Office of Research & Occupational Safety

Gentlemen:

Subject: NRC Inspection of NEL Research Reactor - UCLA

This refers to the routine inspection conducted by Messrs. M. Cillis and E. Garcia of this office on April 5-9, 1982 of activities authorized by NRC License No. R-71, and to the discussions of our findings held by Messrs. Cillis and Garcia with Dr. Wegst and other members of your staff at the conclusion of the inspection.

The inspection was an examination of the activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel and observations by the inspector.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements as set forth in the Notice of Violation, enclosed herewith as Appendix A.

Your response to this notice is to be submitted in accordance with the provisions of 10 CFR 2.201 as stated in Appendix A, Notice of Violation.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosures will be placed in the NRC Public Document Room unless you notify this office, by telephone within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act 1980, PL96-511.

Sincerely,

ORIGINAL SIGNED BY
G. S. SPENCER

G. S. Spencer
Director, Division of Technical Inspection

Enclosures:
A. Notice of Violation
B. Inspection Report 50-142/32-01

cc w/enclosures:
Dr. I. Catton, Director, NEL, UCLA

APPENDIX A

NOTICE OF VIOLATION

University of California at Los Angeles
Nuclear Engineering Laboratory

Docket No. 50-142

As a result of the inspection conducted during the period of April 5 through April 9, 1982, and in accordance with the Enforcement Policy, (10 CFR Part 2, Appendix C), 47 FR 9987 (March 9, 1982), the following violations were identified:

A. Technical Specification, Section VIII.J "Procedures" states in part that, "The facility shall be operated and maintained in accordance with approved written procedures. All procedures and major changes thereto shall be reviewed and approved by the Director of the Nuclear Energy Laboratory prior to being effective. ...The following types of written procedures shall be maintained: ... 3. Radiological control procedures for all facility personnel."

Contrary to the above requirement, at the time of the inspection no approved written procedures existed for the control and calibration of portable radiation survey instruments. In addition, on January 27, 1982 a procedure was used to calibrate the Area Radiation Monitors that had not been reviewed and approved by the Director of the Nuclear Energy Laboratory.

This is a Severity Level IV Violation (Supplement IV).

B. Technical Specification, Section VIII.H requires the Radiation Use Committee to review facility procedures and records for safety considerations and recommend improvements where appropriate.

Contrary to this requirement, at the time of this inspection the procedure mentioned in A above, for the calibration of the Area Radiation Monitors, had not been reviewed by the Radiation Use Committee.

This is a Severity Level V Violation (Supplement IV).

Pursuant to the provisions of 10 CFR 2.201, University of California at Los Angeles is hereby required to submit to this office within thirty days of the date of this Notice, a written statement or explanation in reply, including: (1) the corrective steps which have been taken and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

Dated June 9, 1982

F. A. Wenslawski

F. A. Wenslawski, Chief, Reactor Radiation Protection Section

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-142/82-01

Docket No. 50-142 License No. R-71 Safeguards Group _____

Licensee: University of California at Los Angeles

Los Angeles, California 90024

Facility Name: UCLA Research Reactor (Argonaut-100 Kw)

Inspection at: UCLA Campus

Inspection conducted: April 5-9, 1982

Inspectors: E. M. Garcia for M. Cillis, Radiation Specialist — June 7, 1982 Date Signed

E. M. Garcia E. Garcia, Radiation Specialist — June 7, 1982 Date Signed

Approved by: F. A. Wenslawski F. A. Wenslawski, Chief, Reactor Radiation Protection Section — 6/8/82 Date Signed

Approved by: for R. E. Thomas H. E. Book, Chief, Radiological Safety Branch — 6/9/82 Date Signed

Inspection Summary

Inspection on April 5-9, 1982 (Report No. 50-142/82-01)

Areas Inspected: Routine inspection of the radiation protection program including organization, personnel monitoring, posting, surveys, effluent releases, training, instrument calibration, audit of records/reports; emergency planning; radioactive material transportation activities; independent radiation surveys to determine argon-41 dose rates on the roof and a tour of the facility. The inspection involved 74 hours on site inspection effort by two NRC inspectors.

Results: Of the 12 areas examined, two items of noncompliance were identified in one area. (See paragraph 2.f.1 and 2.f.2).

DETAILS

1. Persons Contacted

*R. Reyes, Reactor Health Physicist
*N. Ostrander, Manager, Nuclear Energy Laboratory
*A. Zane, Reactor Supervisor
Professor I. Catton, Director, Nuclear Energy Laboaratory
J. McLauglin, Radiation Safety Officer
*H. Kaufmann, Campus Health Physicist
*C. Ashbaugh, Nuclear Engineer/Security Officer
G. Bell, Reactor Operator
Lt. R. Duncan, Campus Police Department
*W. F. Wegst, Ph.D, Director, Office of Research & Occupational Health

*Denotes those individuals attending the exit interview on April 9, 1982.

In addition to the individuals noted above, the inspectors met with and interviewed other members of the licensee's staff.

2. Radiation Protection

a. Organization

The reactor health physicist has held the position since March 18, 1981. He reports directly to the Radiation Safety Officer (RSO). The reactor and campus radiation safety programs are under the direction of the Director of Office of Research and Occupational Safety (OR & OS). The RSO who is responsible for managing the reactor and campus radiation protection programs reports directly to the Director.

The current reactor health physicist had assumed this role when the former health physicist was promoted to RSO. The former health physicist subsequently terminated his employment at UCLA and a new RSO, a certified health physicist, was appointed.

Line responsibility for radiological safety at the NEL includes successively, the Campus Radiation Safety Committee, the Office of Research & Occupational Safety, Radiological Safety Office and the resident NEL reactor health physicist.

Discussions with the reactor health physicist revealed that he has had no prior experience in the implementation and enforcement of a radiation protection program at an operating research or power reactor. His major related prior experience was as an x-ray technologist. He holds a PhD in education.

The inspectors identified additional items in regard to the reactor health physicist's capabilities. The additional items are based on the inspectors' personal observations, discussions with the NEL staff and reactor health physicist and from the inspection findings discussed in the subsequent sections of this inspection report.

These matters are summarized as follows:

(1) Part VIII.G of the Technical Specifications requires the reactor health physicist to implement and enforce the radiation safety program at the NEL. Discussions held with the reactor health physicist revealed he was not aware of this requirement because he had not read a copy of the Technical Specifications.

(2) The reactor health physicist stated he was not familiar with Titles 10 or 49 of the Code of Federal Regulations. After discussions with the individual the inspector concluded that the reactor health physicist's knowledge of Parts 19 and 20 to Title 10 of the Code of Federal Regulations was minimal.

(3) The RSO had provided the current reactor health physicist with a written list of duties and responsibilities. The reactor health physicist could not locate the list during the inspection and stated he was not sure whether he was fulfilling those duties and responsibilities.

The reactor health physicist's duties, responsibilities and performance were discussed with the RSO and the Director of OR & OS during the inspection and at the exit interview. Emphasized was the need to ensure the individual's qualifications and training are commensurate with the complexity of the facility's operation even though there are no specific regulatory requirements regarding the selection and qualification of the reactor health physicist position.

Two recent memorandums, dated in February 1982, concerning the health physicist's responsibilities were reviewed by the inspector. The memos, which were issued by the RSO, indicated the reactor health physicist's responsibilities were being redirected. The intent of the memorandums was to provide the reactor health physicist the time that is required to adequately support reactor operations and to improve the Radiological Safety Program at the NEL facility.

Both the RSO and Director of OR & OS agreed that the reactor radiation protection program will receive their immediate attention.

No items of noncompliance or deviations were identified.

b. Training

The NEL reactor health physicist and the Nuclear Engineer/ Security Officer conduct training pursuant to 10 CFR 19.12 as needed for individuals requiring use of the reactor facility. An examination is administered to all participants at the end of training. The training course is informal in nature. Handouts which include a copy of the NEL emergency plan are provided to participants. Participants are expected to obtain a passing grade of 80% in order to qualify for a film badge and access to the NEL facility. The reactor healt. physicist stated the training also includes instructions and a demonstration on the use of portable radiation survey instruments used at the NEL facility. Participants who have obtained a passing grade on the exam are thereby qualified to use the portable survey instruments. Neither the training outline or exam contained any reference to the use of portable survey instruments. The instructions do not include a discussion on the type of surveys that a participant is authorized to perform. The reactor health physicist was also unable to state the types of surveys that participants are authorized to perform. This aspect of the inspection findings is further discussed in paragraph f.(1) below.

The examinations for qualified individuals were reviewed during the inspection. The examinations could not be located for two individuals who were qualified for unescorted access and having keys to the NEL facility. This finding was discussed with the NEL staff and at the exit interview.

No items of noncompliance or deviations were noted.

c. Posting and Labeling

A review of the facility posting was made during a walk through inspection of the NEL. The posting requirement of 10 CFR 19.11 had been fullfilled.

Numerous empty containers and old irradiated sample vials were observed throughout the NEL facility. The items were identified with yellow and magenta tape. A discussion with the reactor health physicist indicated the empty containers were not contaminated and no longer contained radioactive materials. He also stated the irradiated sample vials, which at one time may have contained radioactive material, have since decayed to nondetectable radiation levels and therefore could be released as nonradioactive material. The reactor health physicist added that many of the empty containers had been identified with the yellow and magenta tape to prevent them from being confiscated by personnel. The need to review 10 CFR 20.203(f).4 requirements was emphasized during discussions with the reactor health physicist.

The tour revealed inconsistencies in the posting of radiation and high radiation areas pursuant to 10 CFR 20.203. The postings appeared to be conservative (i.e. more restrictive). One area of the high bay had a radiation area posted within an area posted as a high radiation area. Radiation surveys of the area indicated it was a radiation area. Two other areas within the high bay area, which were identified as high radiation areas, actually were only radiation areas.

A sheet metal building (called Equipment Room) located on the third floor roof top directly over the reactor was observed during the facility tour. Access to this facility is controlled because of the existence of radiation levels during reactor operations (see paragraph 2.d). Access to the Equipment Room structure is by way of a locked doorway located in a chain link fence. A posted sign identifying the area as a controlled area and whom to contact for entry was not visible from the normal entrance path. Although the sign was not required by 10 CFR 20, the lack of conspicuous posting was pointed out to the licensee as defeating the reason for posting. Keys for gaining entry to the area are maintained by NEL staff.

The purpose of postings, labels and signs was discussed with the reactor health physicist, NEL staff and at the exit interview. The need for posting, labeling and installation of signs to provide information that is meaningful and is consistent with 10 CFR 20.203 was emphasized.

No items of noncompliance or deviations were identified.

d. Surveys

Weekly radiation, contamination and air sampling surveys are performed in and around the NEL reactor facility. More comprehensive and detailed surveys of the facility, the reactor shield and process area are performed on an annual basis. In addition surveys are made whenever special experimental configurations, new experiments or shielding modifications are made or other conditions warrant such surveys.

An examination of survey records was conducted. Contamination survey results were in the background range of 7 to 17 cpm. Contamination levels greater than two times background are investigated. Contamination surveys performed in 1981 were negative. The need to report results for contamination and air samples surveys in units that are consistent with 10 CFR 20.401(b), Records for Surveys, Radiation Monitoring and Disposal and 10 CFR 20.5, "Units of Radioactivity" (i.e. uCi, dpm, uCi/ml etc) was discussed with the reactor health physicist and at the exit interview.

Radiation levels inside the reactor high bay area indicated levels in the range of less than 1.0 - 150 mrem/hr combined beta-gamma and neutron radiation. Radiation surveys outside the high bay area were at background levels except for the reactor's roof top area located on the third level. The roof top area (discussed in 2.c above) is a chain link fenced-in area which is maintained locked. Keys to the area are maintained under the strict control of the reactor supervisor. Radiation levels on the roof directly over the top of the reactor (inside of the Equipment Room) ranged from 0.1 - 7.0 mrem/hr. Radiation levels at the roof top fenced-in boundaries were all less than 0.1 mrem/hr while the reactor is operating at 100 KW. Radiation levels inside the Equipment Room and at the fenced-in boundries are nondetectable (background) when the reactor is shut down.

An independent radiation survey was conducted in the reactor high bay area and reactor roof top with an NRC model E520 Eberline survey meter, serial number 1462 and property number NRC-006385 which was calibrated on March 22, 1982. Results of the survey indicated levels that were 10 to 40% higher than what was recorded by the licensee's surveys.

In light of the NRC survey results and the findings of Section 2.f.1 of this report, the need for the licensee to confirm the calibrations of their portable instruments and re-evaluate their current calibration practices for adequacy was discussed at the exit interview.

A review of the reactor operation log indicated that radiation surveys of irradiated samples were being performed prior to shipment from the NEL facility.

No items of noncompliance or deviations were identified.

e. Personnel Monitoring

External radiation exposures are measured using film badges which are issued and processed by the campus radiological safety office. Badges of selected NEL and faculty personnel are changed monthly. Student badges are changed monthly or quarterly dependent on the nature of their activity at the NEL. Self reading pocket dosimeters and neutron dosimetry film are issued when the need is determined by the reactor health physicist. The RSO stated the University was in the process of considering contracting a TLD/film badge service from a private vendor.

Examination of records revealed there was a considerable decrease in exposures received by NEL personnel. Discussions with the NEL staff revealed that this was attributable to reduced reactor usage and an effective ALARA program. Personnel dosimetry records indicated that no personnel exposure was received since the last NRC radiation protection inspection of November 1980. The examination also revealed that the campus activity responsible for maintaining the official copy of personnel exposure records was not clearly established. A member of the radiation safety office stated the reactor health physicist was responsible for maintaining the official records for NEL personnel. The reactor health physicist stated he was not aware of this responsibility.

The examination revealed that the reactor health physicist had not received any exposure since his assignment to the NEL. The exposure records for the previously assigned health physicist disclosed annual exposures of approximately 125 to 425 mrem per year were received by the individual during the period between 1972 and 1980. A reasonable answer with respect to his zero exposure was not apparent to the reactor health physicist when asked by the inspector. His assignments and responsibility are such that some exposure might be expected while providing surveillance of NEL operations. A portion of his responsibilities are to perform bi-annual and annual calibrations of portable survey instruments, perform routine weekly radiation, air and contamination surveys, perform surveys of irradiated samples removed from the NEL, and generally enforce the radiological controls during reactor operations. The inspector discussed the need to investigate the exposures at the exit interview.

The licensee maintains a quarterly bioassay program and whole body counting program for key NEL personnel. Bioassay and whole body counting records examined indicated negative results.

The need to resolve which campus activity has the responsibility for personnel exposure records was discussed at the exit interview.

No items of noncompliance or deviations were identified.

f. Instrument Calibrations

(1) Portable Survey Instruments

The reactor health physicist is assigned the responsibility for ensuring portable survey instruments, hand and foot counters, pocket dosimeters and scalers for counting contamination surveys are maintained operable and routinely checked for calibrations.

The inspector held discussions with the reactor health physicist regarding calibration, use and control of portable survey instruments. In addition a visual inspection of portable survey instruments and examinations of procedures for performing maintenance and calibrations and a review of calibration records were conducted.

The inspection disclosed the following findings:

(a) Procedures for performing calibrations were nonexistent with the exception of manuals which were provided by the vendors. The reactor health physicist stated that written procedures for performing calibrations and maintenance checks were not available and he was not utilizing the vendors manuals for performing these checks.

(b) Acceptance criteria has not been established.

(c) An inventory that listed the types of instruments, their location and their calibration status has not been established. A separate record is used for each instrument; however, the reactor health physicist was not aware if the individual files included all of the instruments located throughout the areas of his responsibility. The inspector noted that a record for an instrument located in the emergency kit was not included in the instrument files. Other records for instruments at the NEL appeared to be missing or misplaced.

(d) A frequency for performing calibrations has not been officially established. The reactor health physicist stated he had established a policy to calibrate the instruments on a bi-annual and annual frequency. A check between calibration records and calibration labels affixed to each instrument indicated they were not in agreement with each other. Some calibration labels have not been changed since August of 1980 although the records indicated calibrations were performed at six month intervals since that time. The inspection did not identify a single calibration label that was in agreement with the licensee's records. The most recent records indicated the portable instruments were calibrated in January and February of 1982; however, none of the instrument calibration labels were changed to reflect this latest calibration. The most recent

calibration label was dated September of 1981. A calibration record for the instrument located in the emergency kit was not included in the individual files. A separate record for this instrument was located in the Emergency Kit. The date on this record was not in agreement with the calibration label affixed to the instrument. Individual calibration records for other instruments observed at the NEL could not be located.

(e) The reactor health physicist was unaware of ANSI-N323, 1978, "Radiation Protection Instrumentation Test and Calibration." The contents of this standard were discussed with the reactor health physicist.

(f) A review of the records revealed that the linear responses of survey instruments were not checked over the full range of the instrument. The checks only considered selected points between 0 and 50% of full scale in lieu of the recommended guidelines of 25%, 50% and 75% of full scale.

(g) The reactor health physicist had identified three portable survey instruments that he determined to be malfunctioning and were therefore considered to be unreliable for use. Two of the instruments, an Eberline E510 and Technical Associates Model TBM-3, were located in his office and the third a Teletector Model 6112 was located near the entrance to the reactor Hi-Bay Area. None of the instruments were tagged out of service, nor did the calibration records identify that they were malfunctioning. The reactor supervisor stated he thought the Teletector was functioning properly and would not hesitate to use it for performing surveys. The other two, although locked in the reactor health physicist's office, were accessible to selected NEL personnel having master keys to the area.

The Technical Associates instrument had a calibration label affixed to it that indicated the calibration frequency was at 1 1/2 year intervals. The reactor health physicist stated the vendor's calibration label had not been changed on this instrument since it was purchased. The reactor health physicist was unable to provide the inspector with a reasonable response as to why he did not take positive action to remove the malfunctioning instruments from service nor was it apparent to him the safety consideration that could result if an individual used a defective instrument.

(h) The reactor health physicist was not aware of how to check the condition of a 90 volt battery supply installed in a Victoreen, Model 470A radiation survey instrument assigned at the NEL. The procedure for performing this check is discussed in the vendors operating manual. The inspector showed the reactor health physicist how to perform the check recommending it be checked during each calibration as a minimum.

The discussions also revealed that the NEL staff and workers who are authorized entry to the NEL facilities are instructed in the use of portable survey instruments. The instructions are provided by the reactor health physicist. Procedures for the use, issue, control, and types of surveys authorized to be taken by the users were not available. The training outline for qualifying NEL users did not include a discussion on this subject.

Failure to provide procedures for the calibration and control of portable radiation detection instruments represents noncompliance with Technical Specifications, Part VIII.J.3 which states in part that radiological control procedures for all facility personnel be written and maintained. (82-01-01).

(2) Fixed Area Radiation Monitors

The inspectors reviewed the procedures for performing calibration of Area Radiation Monitors required by Section V.A of the Technical Specifications. The inspection also included an examination of the calibration records for the period January 1981 through March 1982.

The NEL facility is continuously monitored by four Area Radiation Monitors. Three monitors are located in the high bay reactor room and the fourth monitor is located in the radioactive material storage area. All monitors are capable of audibly warning personnel of high radiation levels. One of the three monitors in the high bay reactor room is capable of providing a warning signal at the Campus Police Department of radiation levels in excess of 25 mr/hr. This monitor is located on the north wall of the reactor room. Only two of the four monitors are required by the Technical Specification. They are located on the east and west walls of the high bay reactor room. The output of these monitors is continuously displayed in the control room.

The examination revealed that the calibrations were conducted at the frequencies identified in Technical Specifications. The examination of calibration records revealed the following:

On January 27, 1982 a calibration was performed using a procedure entitled "Area Radiation Monitors". The inspector noted several deficiencies. The procedure lacked an "acceptance criteria" for any of the twenty-three numerical values that are checked during the calibration. In two cases the recorded values were accepted by the technician performing the calibration even though the results were off by as much as 35% of the expected values. Some of the instruments have a maximum value of 1,000 mr/hr; however, the technician had noted the response to be 1000+. Thus the extent of the discrepancy could not be determined. The procedure did not require that the calibration results be reviewed and approved by the reactor supervisor (the individual having the responsibility for accomplishing the calibrations).

The inspector asked the reactor supervisor if he felt the procedure had safety significance. The reactor supervisor stated that he felt it did and added that he would not have accepted the results if he had reviewed them. The inspector then asked if the reactor supervisor felt the procedure was adequate. The reactor supervisor felt that it was not adequate.

When the manager of the Nuclear Engineering Laboratory was asked similar questions he stated that the calibration of the area monitors had safety significance and that the lack of an acceptance criteria made the procedure inadequate.

It was determined that the procedure had not been reviewed and approved by the Director of the Nuclear Engineering Laboratory or by the Radiation Use Committee.

Failure to have the Director of the NEL review and approve the area radiation monitor calibration procedure represents noncompliance with Technical Specifications, Section VIII.J which states in part, "The facility shall be operated and maintained in accordance with approved written procedures. All procedures and major changes thereto shall be reviewed and approved by the Director of the Nuclear Energy Laboratory prior to being effective... The following types of written procedures shall be maintained... 3. Radiological control procedures for all facility personnel." (82-01-02)

Failure to have a procedure for the calibration of area radiation monitors, a safety significant procedure, reviewed by the Radiation Use Committee is in noncompliance with Technical Specification, Section VIII.H which requires the Radiation Use Committee to review facility procedures and records for safety considerations and recommend improvement where appropriate. (82-01-03)

3. Emergency Planning

a. Tests and Drills

The inspector verified by discussions with licensee representatives and an examination of records that evacuation drills were conducted at the frequency specified in paragraph VIII.J. 4 of the Technical Specifications. A critique was held at the end of each drill by the Reactor Supervisor and Manager of NEL. Three drills had been conducted since the last inspection. All problems identified in the critique minutes had been corrected by the time of this inspection.

No items of noncompliance or deviations were identified.

b. Emergency Equipment and Kits

The inspector examined the contents of the emergency kit specified in the emergency plan. The emergency kit in the control room was complete. The kit contained a survey instrument with a calibration label attached that indicated it had not been calibrated since September of 1980 although a calibration record for the instrument which was also located in the kit, indicated it was last calibrated in April of 1981 and was due for recalibration in April of 1982. The kit also contained a half mask air purifying respirator for particulates. The inspector informed the licensee representative that the half-mask would only provide limited protection in the event of a real radiological emergency. The inspector discussed the importance for updating the calibration labels affixed to survey instruments and maintaining calibration records in a central filing area at the exit interview.

No items of noncompliance or deviations were identified.

c. Emergency Procedures

The licensee is currently using a two page emergency procedure dated 14 October 1980. The plan includes a Reactor Emergency Call list. The call list provides the telephone numbers for key NEL personnel, campus emergency response activities and outside agencies. The inspector recommended that the call list should include radio pager numbers for key NEL personnel. The licensee was in agreement.

The inspector was provided with a copy of a revised emergency plan dated March 1982 that has been submitted to the NRC for approval pursuant to 10 CFR 50.54(r) to show compliance with Appendix E of Part 50. Implementing procedures for the revised plan are currently being developed by the licensee staff. Implementation of the revised plan is expected to become effective at the time of license renewal.

No items of noncompliance or deviations were identified.

d. Familiarization Tours

The licensee provides familarization tours of the reactor facility for the Campus Police Department and for local Fire Department Inspectors. The inspector verified by discussions with NEL and Campus Police Department representatives and examination of records that the tours were provided in December of 1981.

The inspector also noted that copies of the emergency plan were conspicuously posted throughout the NEL facility and at the Campus Police Department.

All licensed reactor operators and senior reactor operators are retrained to the emergency plan on an annual basis. Remaining personnel are provided with emergency plan training at the time they are authorized access to the NEL facilities.

No items of noncompliance or deviations were identified.

e. Support Groups

A visit was made to the Campus Police Department. A discussion was held with Lt. Duncan regarding emergency response procedures and the radiation area monitor alarm associated with the reactor facility. As a result of the discussion, it was determined that the campus police were aware of the NEL Emergency Plan and the significance of the reactor's radiation area monitor alarm.

No items of noncompliance or deviations were identified.

4. Waste Disposal

a. Liquid Waste Releases

An examination of the liquid waste releases for 1981 to April 1982 indicated one release to the sanitary sewer was made on August 26, 1981. The release consisted of 335 gallons having a concentration

of 2.6 E-7 uCi/ml, Zinc-63. The total activity of the release was 3.27E-1 microcuries. The release was within 10 CFR 20 limits.

No items of noncompliance or deviation were identified.

b. Solid Waste

Licensee representatives reported that there was no solid waste generated from reactor operations since the last inspection.

No items of noncompliance or deviations were identified.

5. Effluent Releases

An examination of the weekly air particulate stack sample records for the period January 1, 1981 to April 1, 1982 indicated activity averaged approximately 2 X 10^{-12} uCi/ml. All sampling data results were within Appendix B, 10 CFR 20 limits.

Records of gaseous releases for the period of January 1, 1981 through April 1, 1982 were examined to determine compliance with paragraph D and E of Part V to the Technical Specifications. Paragraphs D and E of Part V require that releases of radioactivity be kept as low a level as practical and the concentration of Argon-41 released to the atmosphere shall not exceed the limits of 10 CFR 20, Appendix B, Table II, Column 1 with a reduction factor of 460 which is defined as the product of (1) a reactor use factor, (2) an occupancy factor and (3) a dilution factor.

Gaseous releases of Argon-41 are monitored continuously by the stack gas monitor which draws a sample of the gaseous effluent from the facility exhaust duct. During reactor operations the output of the stack monitor is continuously recorded on a strip chart.

The total Argon-41 releases for the periods of January 1 through December 31, 1981 and January 1 through 26 March 1982 are 42.98 and 12.7 curies, respectively. These values represent a substantial decrease from the values released (58 to 83 curies) during the previous three years. Peak concentrations as indicated by the Argon-41 monitor have been maintained below the limits imposed by the Technical Specifications, Section V.E.

The inspection revealed that the continuous monitoring of radioactive gases and the semi-annual calibrations of the effluent monitor required by Section V.B. and V.C. of the Technical Specifications are conducted by the licensee as required.

The inspector verified from an examination of records, discussions with personnel and from personal observations that the reactor use factor and the roof occupancy factor have been maintained below the basis of the limits imposed by Section V.E. of the Technical Specifications. The reactor use factor and occupancy factor are discussed in IE Inspection Report

50-142/79-04. The roof area containing the facility stack is maintained as a restricted area as discussed in inspection report 79-04. Access to the roof area is under the strict control of the NEL reactor staff. The inspectors spent a considerable amount of time on the roof top during which time it was noted the door to the roof area containing the facility stack was constantly locked and the adjacent roof tops to the north and south were unoccupied.

The inspection disclosed that the licensee has conducted several experiments for the purpose of determining methods to further reduce Argon-41 releases. The new methods being developed include such things as controlled throttling of discharge valves, sealing of voids to reduce air spaces and the purging of air spaces with a nitrogen blanket. These experiments which appear to be promising have not yet been completed. Implementation of the new methods will depend on the results of further licensee experiments which are still in progress.

No items of noncompliance or deviations were identified.

6. Annual Reports

An examination was conducted to determine the status of the routine 1981 annual report required by Part VIII.M.3 of the Technical Specifications. Submittal of this report for the past three years has ranged from 3 months to approximately 10 months after each of the 12 month periods. The 1980 report was submitted September 21, 1981. A review of the 1980 annual report was conducted. The data reviewed revealed no obvious mistakes or anomalous measurements results.

The examination revealed that the report for 1981 is still in the preparation stage. The need for attempting to submit these reports in a more timely fashion was stressed with the NEL staff and at the exit interview.

No items of noncompliance or deviations were identified.

7. Special Survey of Argon-41 releases

The inspectors conducted a special survey of the NEL facilities during reactor operations to determine the dose rate resulting from the Argon-41 releases. The survey was conducted by utilizing a NRC Reuter-Stokes RSS-111 Environmental Radiation Monitor. The RSS-111 is a pressurized ion chamber designed to detect gamma rays in the energy range of 0.1 to 5 Mev at a gamma flux range of 1 to 500 ur/hr. Serial number of the unit used is Z-3999 and NRC property number 009282. The unit was last calibrated on June 10, 1981, and it is due for calibration on June 10, 1982.

Measurements were taken at three locations: (1) the roof of the Math Science addition, (2) inside the reactor exhaust stack plenum, and (3) inside the ventilation inlet plenum of the Math Science addition at the eighth floor. A background measurement was made prior to each reactor operation. The measurements were made on April 6 to 8, 1982. The survey data collected are included as Table 1 and are discussed below.

a. Measurements taken on the roof of the Mathematical Sciences Addition on April 6, 1982, are as follows. The background was counted for 319 minutes; the accumulated dose for that period was 53 ur. Thus the average background rate was 10.0 ur/hr. Using an energy response correction factor of 0.98 the resulting corrected average background rate is 9.8 ur/hr. The reactor operated at full power (100 KW) for 2 hours. The dose was integrated from the time the reactor went critical until the instantaneous dose rate had returned to background. The total time for this measurement was 254 minutes. The integrated dose for the sample time was 48 ur, resulting in a corrected average dose rate for the total sample time of 11.1 ur/hr. The maximum corrected instantaneous dose rates recorded for background and sample times were 12.5 and 14.0 ur/hr, respectively.

   A more useful value would be the average total exposure (less background) per hour of full power operation; i.e. the total exposure contribution from startup, full power operation, shutdown and return to background averaged over only the time the reactor was at full power. This value would allow exposure projections based on effective full power hours regardless of occupancy times and represents a "worse case" situation. This measured value was 2.8 ur/hr for each hour of full power operation. For the 437 full power hours of operation authorized per year, this exposure rate would result in an individual receiving an annual dose of 1.24 mrem or approximately 1.4% above background. This value is based on the meteorological conditions existing during the time of the measurement, i.e. wind of approximately 5 mph in the direction from the stack to the Math Sciences building air intake structure. In actuality, any real dose would be somewhat less because of occasional occupancy and varied wind direction. The measurements confirm the calculations used to support amendment number 10 to the license and confirm that the dose on the Math Sciences building roof resulting from the reactor operation is insignificant.

b. Measurements taken inside the reactor exhaust stack plenum on April 7, 1982 are as follows: The background was measured for 51 minutes and the integrated dose for that period was 9 ur. The resulting corrected average background dose rate was 10.4 ur/hr. The reactor operated at full power for four hours. The dose was integrated during this period and after shutdown for a total of 531 minutes; resulting in an integrated dose of 345 ur. The corrected average dose rate during the sample period was 38.2 ur/hr. The instantaneous corrected maximum dose rates recorded were 12.5 and 73.5 ur/hr for background and sample time respectively.

The average total exposure rate per hour of full power operation is 61.6 ur/hr. This would result in dose of 26.9 mrem above background for 437 hours of full power operation in one year. This value is an increase of 29.6% above background.

c. The following are measurements taken on April 8, 1982 inside the intake plenum for the Mathematical Sciences Addition. The wind was not blowing from the stack toward the intake plenum on the date of these measurements, they are included for background reference only. Background was measured for 55 minutes, the integrated dose recorded was 11 ur with a resulting corrected average background dose rate of 11.8 ur/hr. The difference in this background rate as compared to that measured on the roof (9.8 ur/hr) is as would be expected due to the accumulation of natural radionuclides in the filter medium inside the plenum. During full power reactor operation the dose was measured for 143 minutes with a recorded integrated dose of 28 ur. The corrected average dose rate for this period is 11.5 ur/hr.

The results of all the measurements taken by the inspectors indicate that the projected doses would not represent a hazard to any individual frequenting surrounding facilities.

No items of noncompliance or deviations were identified.

TABLE 1

Location	Type	Interaction Time	Integrated dose	Average Dose Rate	Energy Correction Factor	Corrected Average Dose Rate	Corrected Average Net Dose Rate	Hours of Full Power Reactor Operation	Corrected Average Net Dose per hour of Full Power Operation	Full Power Reactor Operations hours per year	Dose Above Background Per Year	Yearly Background	% Increase
		min	ur	ur/hr		ur/hr	ur/hr	hrs	ur/hr	hrs	mr/yr	mr/yr	%inc
A	B	C	D	E	F	G	H	I	J	K	L	M	N
(a)	b	319	53	10.00	0.98	9.8							
	s	254	48	11.3	0.98	11.1	1.3	2	2.8	437	1.24	85.8	1.4
(b)	b	51	9	10.6	0.98	10.4							
	s	531	345	39.0	0.98	38.2	27.8	4	61.6	437	26.98	91.1	29.6
(c)	b	55	11	12.0	0.98	11.8							
	s	143	28	11.7	0.98	11.5							

$E = (D/C)X60$ $G = EXF$ $H = G_s - G_b$ $J = (D_s - ((D_b/C_b)\ C_s))/I)\ X\ F$

$L = KxF$ $M = G_b x24x365$ $N = (L/M)x100$

b: background
s: sample

8. Audits

The inspection included an examination of the licensees records of annual in-depth reviews which are required to be performed pursuant to Part VIII.H.3 of the T.S.. The annual in-depth review reports for 1979 and 1980 were examined. The annual in-depth review for 1981 has not yet been accomplished. The licensee was in the process of determining who should perform the 1981 review prior to scheduling it to be accomplished. An attempt is being made to select an independent group not directly associated with NEL operations to perform the in-depth review. The practice of selecting an independent group for performing the reviews was first started in 1981 for the reporting period 1980. Prior to this time the review was conducted by the previous reactor health physicist. The need for accomplishing in-depth reviews by inpartial independent group was stressed during discussions with the NEL staff and at the exit interview.

The 1980 in-depth review, which was performed by an independent group in September of 1981, was described by members of the Radiation Use Committee to be the most thorough review conducted in history of the NEL. The findings and recommendations of the review had been accepted by the NEL Radiation Use Committee on September 30, 1981.

Findings similar to those discussed in this report concerning instrument calibration, radiological control procedures and operating procedures were identified in the latest in-depth review report. The examination revealed that although the in-depth review was adequate; actions to correct the identified deficiencies had not been implemented to date. The licensee had decided to delay implementation of corrective actions pending their license renewal.

The need to implement an effective audit program and to correct deficient items as they are identified was discussed with the NEL staff and at the exit interview.

No items of noncompliance or deviations were identified.

9. Radioactive Material Transfers

Examination of records of irradiations and of transfers of radioactive material for the period July 1981 to March 1982 was conducted during the inspection. All transfers are made to or through the University's state license for subsequent disposal at approved burial grounds. The transfers are normally approved by the reactor health physicist or RSO. Transfer records appeared to be consistent with appropriate 10 CFR 71 and 49 CFR 173 regulations.

No items of noncompliance or deviations were identified.

10. Exit Interview

The inspectors met with the licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on April 9, 1982. The inspectors summarized the scope of the inspection and the findings. The results of the special survey were summarized.

The inspectors emphasized that although none of the findings represented a specific health or safety problem, there appeared to be a degredation of the radiation protection program as noted from previous inspections. Discussed at great length were the two items of noncompliance identified in Section 2.f of this report.

Also discussed were the need to improve:

a. Posting and labeling practices.

b. Maintenance of personnel exposure records.

c. Maintenance and recording of survey results.

d. Correcting audit findings as they are identified.

e. Removal of defective or nonoperable equipment from use and need to schedule its immediate repair or replacement.

f. The reactor health physicist's responsibility for implementation and enforcement of the radiological control program.

CONTENTION X[1/]

The Commission's policies and procedures for implementation of the National Environmental Protection Act of 1969, as amended[2/] (NEPA) are contained in 10 CFR Part 51. Section 51.5 requires environmental impact statements (EIS) to be prepared for the construction and operation of the facilities listed in § 51(a)(1)-(10). Research reactor construction and operation is not included in the facilities listed. Section 51(b) lists various licensing and regulatory actions of the Commission which might require preparation of an EIS, depending on the circumstances. Listed among these possibilities is issuance of a full power license to operate a utilization facility other than those

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1/ X. The relicensing of the UCLA nuclear reactor is a major Federal action which will significantly affect the quality of the human environment. Therefore, an Environmental Impact Statement must be prepared by the NRC. There are suitable alternatives to the operation of this reactor which would not involve a significant impact on the environment.

2. The relicensing of the UCLA research reactor will significantly affect the quality of the human environment because

a. A design basis accident at the reactor is likely, and would expose great numbers of people to dangerous radiation dosages.

b. The reactor is located on a densely populated campus with classroom and office facilities enveloping the reactor building on three sides and above the bulding.

c. The reactor lacks inherent and engineered safety features, including the lack of a containment structure.

d. A design basis accident is likely because of the reactor's use as a training facility and because of the history of lax administrative controls, abnormal occurrences, unscheduled shutdowns and minor accidents.

e. The facility is sited in a seismically active area and suffered significant damage in the 1971 earthquake.

f. The facility utilizes highly enriched (93%) fuel and is vulnerable to criticality accidents.

g. A design basis accident would result in fission product releases in amounts that would endanger the public health and safety.

2/ 42 U.S.C. § 4332.

listed in § 51.5(a). Section 51.5(d)(4) states that unless otherwise determined by the Commission, an EIS, negative declaration or environmental impact appriasal (EIA) need not be prepared in connection with issuance of renewal of a facility license other than those listed in § 51.5(a) and (b) (those which circumstances show should be the subject of an EIS). Therefore, since even the initial construction permit and operating license for a research reactor are not considered by the Commission to be major federal actions significantly affecting the quality of the human environment,[3/] and since § 51.5(d)(4) expressly excludes all facility license renewals from the preparation of an EIS and even from an EIA, it seems abundantly clear that, absent special circumstances, indicated in Section 51.5(b), the UCLA research reactor (second license renewal is not a Commission action requiring an EIS. Thus, it remains only to consider whether any circumstances exist which would indicate that a "major Federal action significantly affecting the quality of the environment" is proposed by this license renewal proceeding.

The Staff SER and EIA issued for this license renewal action show that such is not the case. These documents demonstrate the inherent safety of the UCLA research reactor even under the most severe accident conditions (SER § 14, EIA, p. 4) and show that impacts of normal operation are insignificant. The gaseous effluent (Ar-41) dose is 1.4 mrem/yr; reactor room monitors record only 1 mrem/hr. during full (100 kw) power operation; occupational exposures are minimal; only one shipment of 700 gms. of spent fuel has been made in 20 years; low level wastes, both liquid and solid, are minimal amounts.

3/ 10 CFR § 51.1 defines the purpose and scope of the Commission's Part 51 regulations as those pursuant to 102(2)(C) of the NEPA.

Intervenor alleges that a serious accident and normal emissions could threaten the public, and thus an EIS should be prepared, but interrogatory responses (58-54) show that Intervenor can provide no basis for such assertions, and could provide no evidence at hearing to show that a special circumstance exists requiring an EIS for the renewal of the UCLA Class 104 research reactor license.

Conversely, the Staff has demonstrated by ample scientific evidence in the SER, noted in the EIA, that no special circumstances of environmental impacts exist in this case and that therefore, no EIS is required since no significant environmental impact will result from the license renewal.

In support of this position, the NRC project manager in the Office of Nuclear Reactor Regulation attests in the attached affidavit that his personal review of normal operating emissions and scientific analyses of postulated accidents at the UCLA facility, as well as the twenty year operating history of the facility elicited no data indicating any unusual circumstances which would classify the UCLA license renewal as an action with a significant environmental impact. Thus, the record demonstrates that no EIS need be prepared in accord with Morningside Renewal Council, supra.

Therefore, since the Staff has shown by thorough analysis of operating and possible accident conditions at the UCLA reactor facility, that no significant effect on the environment would occur from continued operation, and since the Commission's 10 CFR Part 51 regulations do not require preparation of environmental impact statements for license renewals absent special circumstances; and since the Intervenor can provide no evidence to show such special circumstances, the Staff submits that Contention X must be dismissed as a matter of law because no material issue of fact exists to be litigation.

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)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION X

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to my affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention X, which I have read in its entirety.

4. I have reviewed all the information submitted by UCLA in its license renewal application and have requested and received NRC technical reviews of the application for inclusion in the Safety Evaluation Report, part of which I have personally written.

5. I have directed NRC consultants in specific studies of the Argonaut reactor design and operation for Staff use.

6. In accordance with the requirements of 10 CFR § 51.5(c), I prepared the Environmental Impact Appraisal for the proposed renewal of the UCLA reactor license which I hereby adopt as my testimony. I have concluded, for the reasons stated therein, that an Environmental Impact Statement need not be prepared for the renewal of the license.

7. My specific reasons are as follows:

a. The effects of the most severe accidents that could be credibly postulated for the UCLA reactor, resulted in no fuel melting. Conservative calculations of release of fission products and personnel exposures from the postulated accidents were within 10 CFR Part 20 and a small fraction of 10 CFR Part 100 guidelines.

b. Results of environmental studies and calculations of concentrations of Argon-41 in unrestricted areas from normal reactor operations indicated concentrations and exposure values that are small fractions of those that are allowed in 10 CFR Part 20.

c. The UCLA reactor has operated intermittently for a period of twenty years with no significant impact on the contiguous population or environment.

d. Annual operating reports indicate low exposure to operating personnel.

e. Twenty years of unannounced inspections by AEC and NRC Inspection and Enforcement personnel have shown no significant violations of safety standards in the Commission's regulations and no risk to public health and safety.

Harold Bernard

Subscribed and sworn to before me
this ____ day of _____, 1981

_____
Notary Public

My Commission expires: _____

CONTENTION XII[1/]

Intervenor attempts by this contention to assert that safety systems and components required by the Commission for power reactors are necessary for a 100 kw research reactor, listing as bases for the assertion, changes in excess reactivity limits; positive graphite coefficient; past events at power reactors; a change in the application describing a defector plate; an assertion that the high level radiation monitor system is inadequate (citing a 1968 I&E report); a tie bolt failure, and a control blade insertion problem requiring maintenance (after the 1968 vibration test referenced in several contentions previously discussed). (Supplemental Contentions pp. 97-106).

Discovery ascertained that Intervenor believes a containment should be constructed to reduce "dose estimates of Applicant without containment"; that

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1/ XII. The safety features of the UCLA reactor are inadequate to protect the public health and safety. Certain engineered safety features are lacking; particularly lacking are features that are redundant and independent. Specifically:

1. The reactor is surrounded by a housing rather than by an adequate containment structure.
2. The radiation monitor system which activates the scram system is inadequate.
3. The reactor does not have an adequate boron-injection system, a radioactivity removal system, emergency liquid and gaseous emissions holding tanks, HEPA filters, an emergency core cooling system, or spare control blade motors.
4. The reactor lacks adequate shielding and access restrictions in areas where the public might be exposed to radiation.
5. The reactor has inadequate or non-existent interlock systems.
6. The reactor lacks missile shields, particularly for control blade drives.
7. Graphite used in reactors undergoes physical changes and thus poses a hazard.
8. The reactor has a history of fuel failures, particularly tie bolt failures.
9. The reactor's control blades are inadequate.

the radiation monitor has been "too extensively shielded and moved too far from its proper location" and that accident consequences will occur at the UCLA facility equivalent to those at large power reactors unless safety systems are installed. (CBG responses 65-72 to Staff interrogatories) But upon inquiry as to any calculations or other evidence Intervenor could provide in support of the assertions, the Intervenor could provide none. (Id.).

It seems quite clear that this contention has no factual basis and is merely a frivolous allegation. The small size, simple design, intermittent operation, and low power levels of research reactors do not pose the potential risks accounted for by 10 CFR Part 50 requirements for safety systems and components in large, complex, continually operating power reactors.

As explained by the attached affidavit of Harold Bernard as well as the SER Section 14 and referenced laboratory studies, no serious consequences would result from the worst possible accident postulated for Argonaut reactors and specifically, the UCLA reactor. It is quite clear that there is no reason to provide the safety components of power reactors listed by this contention. Additionally, the high radiation monitor system is adequate in itself to provide information of excess radiation, and is duplicated by another radiation monitor. (Bernard Affidavit, p. 2, para. 9).

In sum, the Intervenor has no basis and no evidence to support its allegation in this contention that 10 CFR Part 50 safety systems should be implemented or constructed at the UCLA facility. The Intervenor's references to graphite changes and possible excess reactivity do not point to any risk requiring such extreme measures. Otherwise the Intervenor makes totally baseless allegations admittedly unsupported by any evidence. (CBG responses 65-72).

Therefore, because the Intervenor can provide no evidence in support of this contention; because the SER and two scientific laboratory studies as well as the affidavit of H. Bernard demonstrate that no accident could occur at the UCLA facility which would pose a risk to public health and safety, the Staff submits that there is no material issue of fact underlying this contention and that it must be summarily dismissed as a matter of law.

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)
	)	
(UCLA Research Reactor)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION XII

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to my affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention XII, which I have read in its entirety.

4. I have reviewed all the information submitted by UCLA in its license renewal application and have requested and received NRC technical reviews of the application for inclusion in the Safety Evaluation Report, part of which I have personally written.

5. I have directed NRC consultants in specific studies of the Argonaut reactor design and operation for Staff use.

6. The Commission's requirement for containment for power reactors (10 CFR Part 50, Appendix A, General Design Criterion 16) provides a safeguard from uncontrolled releases due to an accident.

7. As indicated in Section 14 of the SER, no significant releases would occur from an accident at the UCLA research reactor so that a containment is not necessary for protection of public health and safety.

8. The present confinement system, described in Section 6-1 of the SER, and Technical Specification 5.3.5 provides adequate protection for radiological releases from both normal and accident conditions. The inherent safety of the reactor design and operating characteristics require only a structural housing over the reactor.

9. The radiation monitor system described in Section 3.3 of the Technical Specifications and Table 11-2-1 of the SER is adequate to assure safe operation of the facility. The exhaust duct (stack) monitor acts essentially as a back-up for the safety high radiation monitor system since it alarms if levels of AR-41 above the set points are reached. Thus, radiation levels are doubly monitored and doubly alarmed. Other circuits described in the SER Section 7 provide further information on the control of reactor operations.

10. General Design Criteria and other requirements of 10 CFR Part 50 and Appendix A, containing requirements for power reactors such as boron injection systems, radioactivity removal systems, emergency holding tanks, HEPA filters, emergency core cooling system, or spare motors are not applicable to research reactors due to the inherent safety of design, low operating temperatures and low radiation levels of effluents at research reactors. Therefore, the safety systems for power reactors listed in Contention XII.3. are neither required nor necessary at the UCLA reactor.

11. The concrete biological shield surrounding the reactor effectively protects any persons in the reactor room during operation from any significant radiation exposure (less than 1mr/hr) as explained in Section 12 of the SER which I hereby adopt as my testimony.

12. There is no safety reason to provide interlock systems for the UCLA reactor as indicated by Subpart 5 of Contention XII, since reactor room radiation levels are minimal and there could be no higher levels in adjacent areas of the classroom or reactor building.

13. There is no need for missile shields at the UCLA reactor since there is no possibility that a missile (such as a turbine missile in a power reactor) could be produced. The control blades are not subject to the force necessary by the drive mechanism so that it would become a projectile sufficient to pierce the concrete sheild.

14. Any physical changes in the graphite at the UCLA reactor would be so small as to be negligible since the reactor coolant negative reactivity is much greater than any possible positive reactivity buildup in graphite and the overall reactivity of the core would not be affected.

15. Because of the inherent design safety, low power operation and part-time operation, as well as effluent monitoring, fuel failures would pose no risk to public health and safety.

16. The control blades of the reactor have been shown reliable and adequate for the UCLA and other Argonaut reactors by twenty years of operating experience at these reactors. If damage occurs to the blades, they may be safely repaired or replaced.

17. In sum, it is my opinion that the design and operating features of the UCLA research reactor is safe and needs no additional features.

I hereby attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Harold Bernard

Subscribed and sworn to before me
this _____ day of _____, 1981

_____
Notary Public

My Commission expires:

CONTENTION XIII[1/]

The Intervenor's Supplemental Contention discussion of this contention (pp. 107-109) seems concerned with the failure of UCLA to apply for a part 70 special nuclear materials license and the Intervenor's perceived failure to follow regulatory requirements in the application. Contention I asserts many deficiencies in the application according to the Intervenor's interpretation of the Commission's regulations. As pointed out in the discussion of Contention I, the UCLA application was officially accepted as sufficient in March of 1980. Further, Intervenor misinterprets 10 CFR Part 70 which contains requirements for licenses issued where no Part 50 license is to be granted. It is long standing agency practice to incorporate the SNM license into Part 50 licenses for power reactors, since the information provided discusses the fuel handling equipment, monitoring systems and emergency plans required by the sections of Part 70 cited in the Contention.

But the primary thrust of this contention aims at asserting that an "excessive" amount and enrichment level (of fuel plates) are requested by the Applicant. No specific basis is provided for this allegation in the Supplemental Contentions which consists of vague generalizations about "bomb grade material" and a past spent fuel shipment.

Discovery responses by CBG to Staff interrogatories 73-75 indicate that Intervenor believes UCLA should be limited to the fuel presently in the core because of possible diversion or sabotage of the fuel plates due to Intervenor's view that security is inadequate, and that a lower enrichment level

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1/XIII. The information which Applicant has provided regarding the special nuclear materials license is inadequate to meet the requirements of 10 CFR § 70.22(a)(7) and (a)(8) and § 70.24(a)(1), (2) and (3). The enrichment level requested and the quantity requested of SNM are excessive and thus pose an unnecessary threat to public health and safety.

could be used since in the 1960's other Argonaut reactors used lesser enrichment at start-up testing operations at 10 kw. No reason or reference to support this opinion of Intervenor was provided. (Id.)

It is obvious that Intervenor has no basis and no evidence to support this contention. Security measures are extensively discussed in Staff motion for summary disposition of Contention XX. The University could not reasonably be deprived of additional replacement fuel for the present core and nothing in the Commission's regulations contemplates such a limit.

The allegation that the 4700 gms of uranium-aluminum alloy fuel plates in possession of the University would be the objective of someone intent on manufacturing a nuclear weapon is insupportable and unexplained by the Intervenor. Additionally, UCLA has recently shipped offsite the major portion of its fresh fuel plates. (Letter, W. Wengst to H. Bernard) Thus, the allegation is to this extent, moot.

All Argonaut reactors presently use 90+% enriched U-235 now (Battelle study, p. 3) (SER p. 10), so Intervenor's reference to start-up tests twenty years ago is no basis at all.

The attached affidavit of Harold Bernard explains the 93% fuel enrichment is not a safety concern because no instantaneous reactivity insertions could produce damage or fission releases (p. 1 paras. 4, 5 and 6); that to retain the operating characteristics of the reactor, UCLA must use 93% enrichment (p. 2, paras. 7 and 8); that the fresh fuel plates are safely stored at UCLA in a secure vault with both intrusion and criticality alarms; and that the amount of fresh fuel at UCLA is less than the 5 kg defined as "formula quantity" by the Commission in 10 CFR Part 73. (Id., p. 2).

Therefore, because Intervenor has provided no basis for this contention and can provide no evidence at hearing to support this contention, the Staff submits that there is no issue of material fact underlying this allegation and that Contention XIII must be dismissed as a matter of law.

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)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION XIII

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to my affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention XIII, which I have read in its entirety.

4. Neither the amount of U-235 nor the enrichment of the fuel in the UCLA reactor core is a safety concern because, from an accident consideration, results of BORAX and SPERT tests indicate that in the event of an instantaneous insertion of all the available excess reactivity, (reported as § 3.94 in the BORAX tests) the fuel temperatures will be significantly below that required for fuel or cladding melt and fission products will not be released. Moreover, no accident-induced mechanism can be produced at the UCLA reactor which can provide a rate of reactivity insertion which approaches "instantaneous reactivity insertion" or the mechanical insertion rate in the BORAX tests. Therefore, if an incident occurred which would insert reactivity at the most rapid rate considered possible, it would be at slower rate than in the BORAX tests and the fuel and cladding temperatures would be much less than that achieved by an "instantaneous insertion of reactivity".

5. Excess reactivity is required to overcome inherent neutron reaction poisons, burnup trade-offs, personnel safety in fuel manipulations

and negative reactivity experiments which can be as high as $.90. The limit of excess reactivity in the Technical Specifications reflect the above considerations.

6. The Staff reduced the excess reactivity in the Technical Specifications submitted with the license renewal application form $3.54 to $3.00. The Staff considers this level of excess reactivity to be safe and to pose no hazard to the public.

7. If the desired flux remains the same, the amount of U-235 at lower enrichment would have to be similar to the amount of U-235 contained in 93% enriched fuel.

8. It is necessary for UCLA to use 93% enriched fuel in order to retain the present operating characteristics of the research reactor, because there is no fuel of lower enrichment available at this time which would not materially affect the operating characteristics of the reactor.

9. The use of 93% enriched fuel poses no threat to public health and safety since excess reactivity is not a safety concern in the Argonaut reactor, and especially not at UCLA which is limited to $3.00 excess reactivity by technical specification 3.5.1.3.B.

10. The 4.7 kg of U-235 unirradiated fuel plates are safely stored at UCLA in a secure, locked vault with both criticality and intrusion alarms as described in SER Section 9-1 and Technical Specification 5.3.6.1.

11. Additionally, this amount of fuel is less than that described as "formula quantity" by 10 CFR § 73.2(bb).

12. It is my opinion for the reasons explained in the preceding paragraphs that neither the amount nor the enrichment level of the U-235 fuel plates in possession and use by UCLA are "excessive" or a threat to public health and safety.

I hereby attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Harold Bernard

Subscribed and sworn to before me
this ____ day of _____, 1981

_____
Notary Public

My Commission expires:

CONTENTION XIV[1/]

In the Intervenor's Supplemental Contentions pp. 112-13, the allegation is made that problems found at other Argonaut reactors should be analyzed at the UCLA reactor. The three problems listed were (1) positive temperature graphite coefficient which Intervenor alleges could result in a "reactor runaway," (2) control rod motor problems and (3) water pressure problems. Reference is made to positive graphite coefficient found at the University of Washington Argonaut and at UCLA (a 1968 IE report stated the coefficient appeared to be 0.006% Δ k/k); a rod drive motor problem and a water pressure problem at the University of Florida. The problems are alleged by the Intervenor to be "inherent" in the Argonaut design.

Although the contention alleges that the Applicant must analyze "common problems faced by Argonaut type reactors," discovery response 76(a) to the Staff interrogatory, states "Intervenor's contention is not about specific problems common to Argonaut reactors." Response 76(b) by Intervenor states that evidence of "common problems" in Argonauts is provided in the Supplemental Contentions. The only references there are to the items mentioned above. Thus, the only basis provided to support this contention is a 1968 IE report (positive temperature graphite coefficient); a 1972 IE memorandum regarding a need to replace control rod motors at the University of Florida; and a Washington Post item discussing a water pressure problem at the

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1/ XIV. Applicant in its Safety Analysis Report has failed to adequately analyze common problems faced by Argonaut type reactors. In the absence of such an analysis, Applicant cannot reasonably assure that the operation of the reactor will not endanger the public health and safety.

University of Florida in 1977. (Supplemental Contentions, p. 113). These three minor incidents do not support the Intervenor's allegation that "common problems" exist in Argonauts.

The attached affidavit of Sean C. Hawley, states that because a positive graphite temperature coefficient in Argonauts is produced by heat transference and thus is delayed in time until several hours of operation have occurred, that this coefficient could not produce an inadvertent transient or power excursion. (Hawley, paragraph 4).

Mr. Hawley points out that the Argonaut secondary water system is designed and installed on a site specific basis and thus cannot be considered a "common problem." (Hawley, para. 5). Additionally, only the secondary water system, which does not come into contact with the primary coolant, is connected to the portable water system, and that the secondary system operates at a higher pressure than the primary system so that if the secondary system pressure is insufficient to maintain cooling, the reactor's power level would decrease and eventually shutdown. (Hawley, para. 5). Therefore, there is no basis in fact to support the allegation that reduced water pressure in the secondary coolant is a safety problem common to Argonauts.

Similarly, Mr. Hawley explains that since control blade motors in Argonauts are not mechanically coupled to the control blades, the failure of the motor would not adversely affect the safety of the reactor, since the control blade would fall by gravity into the core (Hawley, para. 6). Replacement motors are necessary only to restart reactor operation, and not to maintain safe shutdown. (Hawley, para. 6). Thus, there is no factual

basis to allege a common safety problem in Argonauts because control rod motors have shown mechanical problems.

An analysis of potential problems or accidents which might occur in Argonaut reactors was performed by the Pacific Northwest Laboratory (Battelle). The research and its results are set out in NUREG/CR-2079 of which Mr. Hawley is a co-author. (Hawley, para. 2). This study examined areas common to Argonauts such as inadvertent transients, compaction of the core, chemical reaction, and graphite fire. (Hawley, para. 7). The results of this research shows that there are no significant common problems in Argonauts because of their design and composition. (Hawley, para. 8).

The previously discussed bases cited by the Intervenor to show that "common problems" exist in Argonauts do not raise an issue of material fact in that no safety concerns are indicated by the three incidents described as "problems". The affidavit of Mr. Hawley explains that several possible accidents in Argonauts have been studied and found to pose no questions of public health and safety, resulting in the conclusion that there are no "common problems" in Argonauts. Therefore, Contention XIV should be dismissed by summary disposition since no issue of material fact exists to support litigation of this contention.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF SEAN C. HAWLEY
IN SUPPORT OF MOTION FOR SUMMARY DISPOSITION

I, Sean C. Hawley, do hereby depose and state:

1) I am a research scientist employed by Battelle, Pacific Northwest Laboratory in the Health Physics Technology Section of the Radiological Sciences Department. A statement of my professional qualifications is attached to this affidavit.

2) I have read contention XIV admitted by the Atomic Safety and Licensing Board. The discussion that follows results from NUREG/CR-2079, "Analysis of Credible Accidents for Argonaut Reactors", of which I was a principal author and which is based on research at the Pacific Northwest Laboratory operated by Battelle Memorial Institute.

3) The intervenors cited three items (an apparent positive graphite temperature coefficient, water pressure fluctuations, and possible lack of replacement motors for control blade drives) as illustrative of problems inherent in the design of Argonaut-type reactors.

4) A temperature coefficient for the graphite moderator/reflector may be measurable at all Argonaut-type reactors. Although

positive temperature coefficients are generally undesirable in nuclear reactors, the existence of such a positive temperature coefficient would not produce any adverse effects or noticeable results if it was effectively masked or counteracted. Masking or counteracting the effects of a positive temperature coefficient may be accomplished by the existence of larger magnitude negative temperature coefficients, or as a result of the relative time in which the positive temperature coefficient produces its effect or both. Temperature coefficients are generally categorized according to how soon their feedback effect is produced after the initial rise in fuel temperature. Temperature coefficients that result from the behavior of the fuel or fuel elements in response to an increased temperature are called prompt temperature coefficients. Those coefficients that result from the behavior of other materials (e.g., moderator, reflector) affected by the heat produced in the fuel are called delayed. Since the heat generated in the fuel must be transferred to the other materials to create a temperature rise, the effects of a temperature coefficient associated with these other materials is not produced until enough time has passed to permit sufficient heat to be transferred to the other materials. In the Argonaut-type design, the graphite is not in contact with the fuel. The heat must be transferred from the fuel to the water moderator/coolant and from the water, which is contained in aluminum structures, ultimately to the graphite and air flowing through the graphite assembly. A graphite temperature coefficient in an Argonaut-type reactor would be a delayed coefficient and in fact would require a very long period of reactor operation (several hours) before it manifests sufficiently to be at all measurable. Therefore, such a delayed temperature coefficient would not play a role in an inadvertent transient or power excursion scenario where the event is measured in terms of fractions of a second to a few seconds.

5) The items or problems alluded to fluctuations in water pressure concern the secondary water system, which as designed and

installed, are site specific and therefore should not be considered as problems that are common or inherent in the Argonaut-type research reactor design. However, some generic comments on water systems typically used at research reactors can be made. The primary cooling system, i.e. that amount of water that circulates through the fuel elements, is not directly connected to the potable water system. Only the secondary system, which does not come in contact or mix with the primary system, is directly connected to the city (potable) water system and thus only this portion (used only for heat removal purposes) of the water system would be subject to pressure/level fluctuations beyond the control of the licensee. Secondary systems are operated at higher pressures than the primary system so that if any leaks develop in the head exchanger the flow of water, if any, would be from the secondary system to the primary system (i.e., from the side connected to the potable system into the reactor) thus protecting the environment. If conditions develop in the secondary system such that sufficient heat transfer capability was not being maintained, the increased temperature of the primary water would cause the reactor power level to decrease. Even if boiling occurred, the combined temperature and void coefficients would reduce reactor power and if boiling continued, then as the water level in the primary system decreased, due to evaporative losses, the reactor would shut down due to the loss of moderation caused by the loss of water. Even if all the water was evaporated or lost, the residual decay heat would not be sufficient to cause fuel melting.

6) Lack of replacement control blade motors would not make the reactor "uncontrollable" in the event of failure of the existing motors. The motors are not mechanically coupled to the control blades. If a motor failed, i.e., a control blade could not be moved by using the motor, then the control blade would fall back into the core by gravity when the power was lost for any

reason, including motor "failure". At this point, an operable motor would be required to start up the reactor (withdraw the control blade). However, the fact that the control blade could not be withdrawn does not make a reactor uncontrollable. On the contrary, it places the reactor in a most controlled or safest condition, i.e., shut down or sub-critical.

7) A study to identify and re-examine credible accidents for Argonaut-type reactors focused on areas common or generic to these reactors and resulted in evaluation of an inadvertent transient, compaction of the core, chemical reaction (metal-water) and a graphite fire. These accidents were evaluated using the basic design of the reactor and materials (e.g. aluminum, graphite, water) in the fuel, moderator and reflector.

For an inadvertent transient or nuclear excursion, the maximum available excess reactivity was taken to be 2.6% $\Delta k/k$. The maximum energy release from such an event, even using very conservative assumptions, would be insufficient to melt the fuel; the maximum hot-spot temperature would be 74°C below the melting point of the cladding.

Rearrangement of the core that alters the spacing of the fuel boxes could reduce the minimum critical mass assuming that the moderator, i.e. water, remained in the core. Such a "perfect" rearrangement, however, would be virtually impossible. If flooding of the core took place during a major structural rearrangement, the total reactivity of the core could be raised by about 14% $\Delta k/k$, again assuming ideal conditions and such improbable events as collapse of the control blade shrouds with the blades removed.

The chemical reaction of aluminum and water, which generates explosive gas, would require high temperatures or finely divided aluminum. The energy necessary to initiate the reaction

would be at least twice that available from an inadvertent supercriticality, and hence the reaction is not considered credible.

A graphite fire can be postulated from many different scenarios, including a major building fire. Given an initiating event, such a fire could result in core melting and fission product release. However, except for a major building conflagration with essentially no suppression, itself a highly unlikely event, there appear to be no credible initiating events.

8) The research conducted in connection with NUPEG/CR-2079 indicates that there are no credible generic or common problems in the Argonaut-type reactors by virtue of their design and composition.

I hereby certify that the preceding information is true and correct to the best of my knowledge and belief.

Sean C. Hawley

Subscribed and sworn before me on this 28th day of October 1981.

Robert L Steichen

Notary Public

ROBERT L STEICHEN, NOTARY PUBLIC
RICHLAND POST OFFICE, WASHINGTON,
COMMISSION EXPIRES AUGUST 15, 1982

My commission expires: _____

SEAN C. HAWLEY

Professional Qualifications

My name is Sean C. Hawley. I am a research scientist employed by the Radiological Sciences Department at Battelle, Pacific Northwest Laboratory, Richland, Washington. I provide support to senior staff in external contacts with sponsors and technical experts and occasionally direct the activities of small groups. I occasonally interact directly with sponsors and scientists external to my group and usually publish as a junior author.

I received a Bachelor of Arts Degree in Chemistry from Reed College, Portland, Oregon in 1978. In addition, I have completed 10 credit hours of graduate level studies in Radiological Sciences at Washington State University and the University of Washington (Joint Center for Graduate Studies, Richland, Washington).

I have about eight years of experience working in areas related to research reactors. I received my first Senior Operator's Permit in 1973 for the Reed College Reactor Facility. I was employed there as a Senior Reactor Operator, Assistant Health Physicist, Reactor Supervisor and Training Supervisor. I received my second Senior Operator's Permit in 1979 for the Washington State University Reactor. I was employed there as Reactor Supervisor.

I am a member of the American Chemical Society.

CONTENTION XV[1/]

The original bases for the issues raised by this contention cited by Intervenor in its Supplemental Contentions, (pp. 114-116) refers to a population increase at and near UCLA; failure to comply with 10 CFR Part 100 (applicable only to power reactors); and the seismic activity of the Los Angeles area. Discovery responses to Staff interrogatories 78-81 show that Intervenor has no factual basis for this contention and could provide no evidence at hearing to support the contention. Thus, the contention is merely an allegation.

The Staff affiant for Part 1 of this contention points out that neither 10 CFR Part 20 nor accident evaluations for Argonaut reactors account for population, but rather, deal only with individual dose assessments (See

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[1/] XV. The operating license for this facility should not be renewed because the adverse consequences which flow from its location and siting are too great. The following circumstances have exacerbated the adverse consequences of a facility accident and of normal operation. Specifically:

1. The density of the population in the unrestricted area immediately surrounding the reactor and within a ten mile radius of the reactor makes the probable consequences of an accident at the facility unacceptably great. This population density has increased greatly over the past twenty years.

2. The reactor building which was originally separated from any other structures is now enveloped on three sides and above by classroom and office buildings. These buildings house a large population during working hours in close proximity to the reactor.

3. The heating, air-conditioning and air-flow systems of the new building enveloping the reactor building interface directly and indirectly with those systems at the reactor facility.

affidavit of Millard Wohl, attached). Thus, the increase of campus and nearby population is irrelevant to a safety evaluation of the UCLA reactor under both normal and accident conditions.

As to the additional buildings on the Campus near the reactor facility and the additional stories built in Boelter Hall over the reactor building, the attached affidavit of Seymour Block demonstrates that neither the interior rooms of the nearest building, Math-Science, nor those of Boelter Hall receive radiological releases of any significance.

A Director's Decision denying a CBG 10 CFR § 2.206 request based on allegations concerning excessive emissions (referenced previously regarding Contention VI) also addresses this subject, and also states that no significant doses from reactor emissions are received in the Math-Science Building rooms.

Therefore, since the Intervenor has provided no basis for this contention and could provide no evidence to support it at hearing; and because Staff has demonstrated that no issue of material fact exists to be heard regarding this contention, the Staff submits that Contention XV must be summarily disposed on the pleadings as a matter of law.

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)	)	

AFFIDAVIT OF MILLARD WOHL
REGARDING CONTENTION XV PART 1

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Millard Wohl, being duly sworn do depose and state as follows:

1. I am a nuclear engineer employed by the U.S. Nuclear Regulatory Commission in the Accident Evaluation Branch of the Division of Systems Integration in the Office of Nuclear Reactor Regulation. A statement of my professional qualifications is attached to my affidavit concerning Contention VIII.

2. The purpose of my affidavit is to address the issues raised by the Committee to Bridge the Gap in Contention XV, Part 1 which I have read in its entirety.

3. The density of the population surrounding the UCLA reactor facility is irrelevant to the requirements of 10 CFR Part 20 which prescribes limits for normal operating effluents. The limits contained in Part 20 have been established on the basis of doses to an individual and not to a population so that an increase in nearby population is of no consequence to the Part 20 emission calculations or limits.

4. Likewise, the postulated accident analyses for the small Argonaut reactors do not rest on population considerations , but also on the individual dose calculations contained in Part 20.

5. As noted in my professional qualifications, I was the NRC contract monitor for the work by Pacific Northwest Laboratory and Los Alamos National Laboratory during their analyses of postulated accidents in the Argonaut reactor contained in NUREG/CR-2079 and NUREG/CR-2198. As

contract monitor, I reviewed and approved the Laboratory studies, their scientific bases, and methodology.

6. As shown in the referenced accident analyses, a serious accident at the UCLA facility would not result in significant radiological releases outside the reactor building. Therefore, a nearby population increase need not be considered in evaluating the renewal of the UCLA license.

7. In summary, for the reasons explained above, it is my opinion that an increase in population density near the UCLA reactor facility is of no significance in the evaluation of the effects of normal operating or accident releases from the reactor.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Millard Wohl

Subscribed and sworn to before me
this _____ day of _____, 1981

_____
Notary Public

My Commission expires:

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)	)	

AFFIDAVIT OF SEYMOUR BLOCK
CONCERNING CONTENTION XV PARTS 2 AND 3

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Seymour Block, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Division of Systems Integration, Radiological Assessment Branch. My professional qualifications are attached to my affidavit concerning Contention VI.

2. The purpose of my affidavit is to address the issues raised by the Committee to Bridge the Gap in Parts 2 and 3 of Contention XV.

3. The staff has calculated the exposure that could be received by individuals occupying the Math-Science Building (MSB) from intake of ^{41}Ar by the ventilation and air conditioning system during normal reactor operations. This building is adjacent to the stack in the predominately downwind direction. The roof of the MSB upon which the ventilation intake is located, is at the approximate elevation as the top of the reactor stack. The calculation considered the dose received by a "maximum individual" occupying a room in the building. A "maximum individual" is defined as one who occupies this room for the entire year during which time the reactor is at power (i.e. 8.4 hours/week) and is subject to the same ^{41}Ar concentration as is on the roof of the MSB (i.e. we assume the same concentration in the room is at the intake to the ventilation system). This is a conservative assumption since by continually mixing roof ^{41}Ar with room ^{41}Ar, an equilibrium concentration is reached which will be less than the roof concentration (e.g. the room ^{41}Ar rapidly decays to lower concentrations because of the short half-life of ^{41}Ar (1.8 hrs)).

4. Argon concentration at the Math-Science building ventilation intake is found as follows:

^{41}Ar concentration at release point of reactor stack = 1.6×10^{-5} $\mu Ci/cc$. From the NRC Safety Evaluation Report Appendix A Technical Specifications, June 1981, the dilution factor at the Math-Science building intake = 4.67×10^{-3} and the Reactor Utilization factor = 0.05.

The calculation is:

$$1.6 \times 10^{-5} \ \frac{\mu Ci}{cc} \times 4.67 \times 10^{-3} \times 0.05 = 3.7 \times 10^{-9} \ \mu Ci/cc$$

From Regulatory Guide 1.109 "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I", table B-1 provides the total body gamma dose factor for exposure to a continuous semi-infinite cloud of ^{41}Ar as $8.84 \times 10^{-3} \ \frac{mrem/yr}{pCi/m^3}$.

To convert to dose rate per $\mu Ci/cc$ the calculation is:

$$^{41}Ar \text{ dose factor} = \frac{8.8 \times 10^{-3} \ mrem/yr}{pCi/m^3} \times \frac{10^6 pCi}{\mu Ci} \times \frac{10^6 cc}{m^3} = 8.8 \times 10^9 \ \frac{mrem/yr}{\mu Ci/cc}$$

Now assuming that this activity enters a classroom with a 9 meter equivalent radius, the ratio of submersion dose rate in a finite room of 9 meter radius to the dose rate for a semi-infinite region is about 0.03. Therefore the dose rate in the classroom will be:

$$3.7 \times 10^{-9} \ \frac{\mu Ci}{cc} \times 0.03 \times 8.8 \times 10^9 \ \frac{mrem/yr}{\mu Ci/cc} = 1.0 \text{ mrem/yr}$$

Thus, a "maximum individual" would receive about 1.0 mrem/yr. This exposure represents approximately 0.2% of 20.105(a) permissible levels of radiation in unrestricted areas.

5. Concentrations and doses in Boelter Hall classrooms would be less than those for the MSB since the MSB and its ventilation intake are in the path of the prevailing winds, whereas the Boelter Hall ventilation intake is upwind from the stack.

6. Based on the above modeling and assumptions, it is my opinion that the dose to the "maximum individual" in the MSB and Boelter Hall Classrooms is well within the limits of Part 20 and is as low as is reasonably achievable.

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

_____
Seymour Block

Subscribed and sworn to before me
this _____ day of _____, 1981

_____
Notary Public

My Commission expires: _____

CONTENTION XVI[1/]

As shown by the SER, Section 17 and the attached Affidavit of Harold Bernard, this contention, alleging generally, that the reactor is too old to be safe has no basis in fact. The 20-year "age" of the reactor and its components does not raise a question of safety. The reactor has operated a small fraction of the time (less that 5%) since initial start-up (SER Section 17) which is the equivalent of only one full year (Bernard Affidavit, p. 2) of operation. In addition, the technical specifications for the reactor require inspections and testing of systems, components and fuel (Technical Specification Section 4.0). Therefore, because the reactor has, in effect, operated for only one year of full time operation, there is no basis for the allegation that the twenty years of the reactor's life has subjected the reactor components to a significant amount of "wear and tear".

Secondly, even were there full time operation of the reactor, the need for replacement or repair of components likewise does not raise an issue of safety since it is assumed in the Commission's safety considerations that

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1/XVI. The UCLA research reactor and the principal component pieces of reactor equipment are so old that relicensing the reactor, particularly for a twenty-year period poses an unacceptable hazard. Because of the age of the reactor it is very difficult to obtain spare parts and key safety features required of newer facilities -- specifically, an emergency core cooling system and a containment structure -- are lacking in this facility. In addition, the following items of equipment are unreliable, difficult to repair and/or replace:

1. The reactor was built in 1959 by a company which is no longer in the reactor business.
2. The reactor equipment is old and outdated and deteriorating. The Applicant has not devoted the money to properly update or maintain the equipment in the past and without a change in Applicant's practices the equipment will continue to deteriorate with age.

components of reactors will require repair and replacement (Bernard Affidavit, pp. 1-2). For this reason, technical specifications are incorporated into all licenses, requiring periodic inspections and tests. Thus, degeneration of components is accounted for by conditions of operation and is not a reason to deny renewal of licenses. In comparison, the Board should take official notice that power reactors are licensed for forty-year terms of full time operation at much higher power levels than that of the UCLA (100 Kw) reactor.

Lastly, when asked to clarify the particular components in question; the specific safety concern indicated by the fact that the original manufacturer of the UCLA reactor is no longer in business; and the particular risk to public safety at issue in this contention, Intervenor responses to Staff interrogatories 82-84 stated only a generalized description of components thought defective; an assertion that since the manufacturer is out of business, the reactor repairs would be "make-shift" or inappropriate and that the assumed inadequate repairs would somehow lead to an undefined "accident".[2/] These answers are vague allegations unsupported by any facts and thus the contention does not raise a litigable issue. Intervenor does not describe any particular component nor its alleged state of degradation, nor the particular accident envisioned possible by Intervenor from the alleged degraded components. No factual basis is provided for Intervenor's unfounded assumption that the University will use inadequate replacements or do faulty repairs. The

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2/ The assertion that the University cannot obtain an ECCS or containment because the manufacturer is out of business has been addressed in the discussion and Affidavit concerning Contention XII, to wit, these safety features are unnecessary.

fact of this matter is that the continued existence of the manufacturer is immaterial since parts can be and commonly are fabricated at machine shops and repairs can be performed without assistance of the manufacturer (Bernard Affidavit, p. 2).

In summary, the Staff submits that because the Intervenor has not raised a litigable issue by specification of any safety concern from any particular degradation of specific reactor components; because the UCLA reactor has operated the equivalent of only one year of full time operation; and because necessary repairs and replacement parts can be obtained by machine shop fabrication; and because the license technical specifications for the UCLA reactor require performance standards, inspections, and tests, Contention XVI should be summarily dismissed since no issue of material fact exists for litigation.

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)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION XVI

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to my affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention XVI, which I have read in its entirety.

4. The intervenors assert that due to the age of the reactor, it is too old to function safely and reliably now and that its usefulness is questionable. They indicate that parts are unavailable and that components are unreliable and may be difficult to maintain and repair.

5. The Commission recognizes at the time that it issues operating licenses to reactor facilities that the design is "fixed" and in the future parts will wear and require repair or replacement. It is for that reason that the Commission issues "Technical Specifications" for each reactor that is licensed. This is a "performance specification", not an "equipment specification" although periodic inspections are required also.

6. The Technical Specifications specify those performance criteria which must be met by the Licensee irrespective of reactor age or component history.

7. Technical Specifications are part of the license to operate. Age is not a facet of the Technical Specifications. For example, the UCLA reactor has been operated for the equivalent of one year of continuous operation. Power reactors are provided with 40-year licenses and have power factors of 15 to 90%. If the Licensee cannot meet a particular performance specification, the reactor cannot be operated until the repair or replacement is done and the requirements of that specification is satisfied.

8. If a component part must be replaced and it is not available "off-the-shelf", then it can be fabricated at a local machine shop. This is standard practice for many types of machined parts and for even new machinery which may have malfunctioned and is not a safety concern.

9. In summary, the UCLA reactor can be operated without any significant hazard concern related to the age of the reactor. The conservative nature of the Technical Specifications assures that the reactor components will be repaired or replaced when necessary for safe operation.

I hereby attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Harold Bernard

Subscribed and sworn to before me
this ___ day of _____, 1981

_____
Notary Public

My Commission expires: _____

CONTENTION XVII[1/]

The Staff's analysis of a severe earthquake which collapses the Boelter Hall classroom building and reactor concrete shield so that the core is crushed shows conclusively that no issue of fact exists to support this contention. (SER Section 14-3 and Affidavit of Harold Bernard, attached.) Since this contention alleges that the UCLA license should not be renewed because of possible danger to the public if an earthquake should damage the reactor, the Staff's analysis shows this allegation to be groundless. The further issue in the contention, that the application does not contain current information on the seismicity of the Los Angeles area, is irrelevant. California is a known seismically active area. The Staff's analysis assumes a "worst case" earthquake consequence. There is no purpose in analyzing the specific probable seismic intensity if the worst damage possible is assumed. Further, the allegation in subpart 2 of this contention is a mischaracterization of the UCLA report on damage from the 1971 earthquake, since the

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[1/] XVII. The UCLA reactor should not be licensed because the physical location and site characteristics of this reactor unacceptably endanger the public health and safety. Furthermore, the license application does not contain current information and analysis concerning the site related safety problems sufficient to support the issuance of a license. Specifically:

1. The reactor is located on one of the most seismically active regions of the country.
2. The reactor sustained significant damage in the 1971 earthquake.
3. The existence of three floors of classrooms and offices, supported on columns, directly above the reactor structure creates a significant danger of collapse through the reactor building roof and onto the reactor itself in the event of an earthquake.
4. The application does not contain current information on siting required by 10 CFR 50.34(b)(1).

quotation cited from the UCLA Annual Report refers to "minor problems" incurred requiring a major maintenance effort a year leter. (Supplemental Contentions, p. 119). Risk from earthquake damage is not a "minor problem" requiring a major maintenance effort a year later (id.). Risk occurs only from damage such that significant radioactive releases ensue. A maintenance problem poses no threat to the public.

CBG responses to Staff interrogatories 85-89 show that Intervenor has no factual basis to support this contention since it has no knowledge of the proper safe shutdown earthquake (SSE) value for the area nor any information on probable damage or consequences from a severe earthquake at or near the UCLA campus. Further, response 87(b) admits that the allegation concerning the 1971 earthquake does not raise a safety issue.

Therefore, because the Intervenor has raised an issue of risk from earthquake for which it has no factual basis, and because analyses by the Staff and two scientific laboratories have encompassed the parameters of the worst possible damage to the UCLA reactor as a result of an earthquake and have demonstrated that no risk to public health and safety exists therefrom, the Staff submits that Contention XVII must be dismissed in its entirety as a matter of law because no material issue of fact exists.

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)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION XVII

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to my affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention XVII, which I have read in its entirety.

4. Since California is known to be a seismically active area, the Staff thought it appropriate to investigate the possible consequences of a severe earthquake which caused a collapse of the classroom building (Boelter Hall) and the biological shield onto the UCLA reactor resulting in a crushed core. As basis for this analysis, the Staff requested a study by Los Alamos National Laboratory (LANL) of the possibility of fuel melt from such a postulated event and also a study by Pacific Northwest Laboratory (Battelle) of the effects of severe mechanical damage to the fuel as well as the dynamics of core rearrangement and building rubble.

5. After receiving the two laboratory analyses, I combined the data produced by Battelle and LANL to derive a comprehensive view of the

consequences of a "worse case" earthquake near UCLA. My analysis and basic data appears on pp. 14-8 to 14-10 of the Safety Evaluation Report (SER), which I hereby adopt and incorporate herein as my testimony.

6. As explained in the SER, the assumptions I used are extremely conservative and yet the resultant potential doses are within 10 CFR Part 20 dose limits for normal operation.

7. It should be noted that the likelihood of the complete collapse of Boelter Hall onto the biological shield is rather small and the further complete collapse of the biological shield onto the reactor is an extremely remote possibility. To further assume that 750 complete (guillotine) breaks occur in the fuel plates and that the reactor has operated long enough to reach equilibrium creates an incredible event, since the reactor may not operate the time necessary to produce inventories of the noble gases and iodines calculated in the analysis (due to technical specifications), and because the amount of mechanical damage to the fuel plates assumed in the analysis is not a reasonable expectation.

8. In summary, it is my opinion based on my analyses explained in Section 14-2.2.6 of the SER that a severe earthquake in the Los Angeles area which caused serious damage to the UCLA research reactor would not create a risk to public health and safety.

I hereby attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Harold Bernard

Subscribed and sworn to before me
this ____ day of _____, 1981

_____
Notary Public

My Commission expires: _____

CONTENTION XVIII[1/]

The original basis cited in support of this assertion that the Applicant, the University of California, is not financially qualified to operate the UCLA reactor was a reference to statements made in 1975-76 by UCLA Staff concerning lack of funds to make modifications to the facility (Supplemental Contentions, pp. 125-126). Discovery response 89 by Intervenor states that the only evidence Intervenor could present to support this contention are the quotations in the Supplemental Contentions. These references describe replacement of an exhaust fan motor and modification of the exhaust stack which, Intervenor indicates, were the subject of an I&E conference in 1975. Other matters referenced are additions or replacements to the facility desired by members of the UCLA Staff but unrelated to safety (Supplemental Contentions, p. 126). Thus, Intervenor has not and cannot provide any basis to show that the University of California cannot obtain funds to maintain safe operation of the UCLA reactor facility.

[1/] XVIII. The Applicant does not possess and cannot give reasonable assurance of obtaining funds sufficient to cover the costs of operating the facility. Given this lack of assurance, Applicant fails to qualify financially for an operating license. Specifically:

1. Applicant has deferred maintenance in the past due to lack of funds.

2. Applicant, as a public institution and subject to yearly funding, cannot reasonably assure that it will obtain sufficient funding for operation of the reactor from year to year.

3. If Applicant, as contended by Intervenor, is operating a facility described in 10 CFR 50.21(b) or 50.22, Applicant has not met the requirement of 10 CFR 50.33(f) that: Applicant possess or have reasonable assurance of obtaining the funds necessary to cover the estimated cost of operation for the license period, plus the estimated cost of permanently shutting down the facility and maintaining it in a safe shutdown.

The attached affidavit of Michael Karlowicz shows that the annual cost of UCLA reactor operation is minimal in comparison to the annual operating budget of UCLA and to the School of Engineering Budget. (Karlowicz at 3-4). More significantly, the financial resources of the University of California, one of the largest state educational institutions in the United States, are certainly more than adequate. (Id., p. 6).

In Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2) CLI-78-1, 7 NRC 1 (1978) the Commission noted that "reasonable assurance" requirements of 10 CFR § 50.33 contemplates actual inquiry into the Applicant's financial qualifications but it does not mean a demonstration of near certainty that an applicant will never be pressed for funds.

Thus, even if the Nuclear Energy Lab has had in the past some difficulty in obtaining funds from the UCLA budget for desired modifications or additions, this raises no issue of the financial qualifications of the University of California since it is quite apparent that the University receives funds annually that are in great excess of those necessary to safely operate the research reactor.

Therefore, since the Intervenor has shown no basis to support this contention and could present no evidence other than the references described above, and because Staff has demonstrated that the financial resources available to UCLA and to the School of Engineering are more than sufficient to fund the operation and maintenance of the UCLA reactor, the Staff submits that this contention must be summarily disposed since no material issue of fact exists which could be litigated.

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)	)	

AFFIDAVIT OF MICHAEL L. KARLOWICZ, JR.
CONCERNING CONTENTION XVIII

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Michael L. Karlowicz, Jr., having first been duly sworn do hereby depose and state as follows:

1. I am employed as a Licensee Relations Analyst by the U.S. Nuclear Regulatory Commission. I am responsible for the performance of the financial qualifications review of applicants during the nuclear licensing process. This review includes an analysis of estimated construction costs in construction permit proceedings and operating expenses in operating license matters. Concomitantly, the financial review encompasses the projected financing methods by which the required funds will be obtained. I also review the climate and trends of state utility commissions. In this regard, I have prepared financial testimony for inclusion in the Staff's Safety Evaluation Reports and for presentation at Atomic Safety and Licensing Board Hearings.

2. My responsibilities also include the monitoring and keeping abreast of the money and capital markets, particularly those affecting the nuclear energy sector of the economy. In this respect, I maintain a regular course of communication with the financial community. This includes utility securities officers and specialists representing the major rating firms, investment banking institutions, brokerage houses, and the Securities and Exchange Commission. Additionally, I maintain contact with the staffs of the Federal and State Utility Commissions.

3. I received a Bachelor of Science Degree with a major in Mathematics in 1972 from Saint Peter's College. In 1976, I received my Juris Doctorate from the Delaware Law School. Thereafter, I attended the post-graduate L.L.M. tax law program at New York University in 1976 through 1977. I have also undertaken studies in finance in the graduate program at the American University School of Business Administration.

4. Prior to my joining the U.S. Nuclear Regulatory Commission in December 1977, I spent three years with the New Jersey Department of the Public Advocate, Division of Rate Counsel. As both Attorney and Economist, my responsibilities included the representation of the public interest in litigation involving proposals of increases in rates or discontinuance of service by regulated industries. From 1969 through 1974 I was employed by Public Service Electric and Gas Company in their System Planning and Development Department and the Office of the Corporate Economist. There, I was responsible for conducting short, medium, and long-range studies in financial planning, the preparation of expert testimony, the implementation and development of financial modeling, and the performance of economic analysis.

5. The purpose of my affidavit is to address Contention XVIII admitted to this proceeding.

6. The Commission's requirement for determining an applicants' financial qualification is stated at 10 CFR § 50.33(f).

7. The estimated total annual cost of operating the UCLA Research Reactor is the cost of operating the Nuclear Engineering Laboratory (NEL) adjusted to exclude costs associated with the non-reactor-related activities of the laboratory and to include other direct and indirect costs that do not appear in the budget or expenditure statements of the NEL. For the 1980/81 fiscal year these costs are given in the following table which is adapted from the cost accounting data prepared by the UCLA Finance Office. A more complete explanation of NEL operating costs can be obtained from UCLA's letters of January 25 and April 19, 1982 to the NRC.

UCLA Nuclear Energy Laboratory

1980-81 Financial Cost Statement

	Total NEL Budget	Non-Reactor Costs	Net Reactor Costs
Salaries - Permanent Staff of 6 FTE	$163,531	$49,805	$113,726
Salaries - General Assistance	38,265	0	38,265
Employee Benefits	34,288	10,459	23,829
Supplies: $43,406; Equipment: $3,641; Travel: $712	47,759	0	47,759
TOTAL NEL Expense	$283,843	$60,264	$223,579
Additional Expenses not reflected in above totals:			
Health Physicist - Salary	28,000	0	28,000
Health Physicist - Employee Benefits	7,266	0	7,266
TOTAL EXPENSE	$319,109	$60,264	$258,845
Indirect Costs @31% Modified Total Direct Costs	97,795	18,682	79,113
TOTAL NEL COSTS	$416,904	$78,946	
TOTAL Reactor Operating Costs			$337,958

Total NEL Expense represents the amount that the NEL had to budget in fiscal year 1980/81 for all its operations. Budget support for the Health Physicist is provided by the Office of Research and Occupational Safety. The precise amount of the indirect costs of reactor operations are unascertainable on an absolute basis but they may be determined by the indirect costs rate that has been established for the University as a percentage of modified total direct costs, that is, direct costs less equipment. Indirect costs are recovered for the campus as a whole and are not identified in the budgets of individual educational units such as the NEL. Since the University's accounting system does not ordinarily distinguish reactor-related costs from non-reactor related costs within the NEL accounts all of NEL "Salaries - General Assistance" are reported as reactor-related expense. However, it is only the salaries of part-time student reactor operators (perhaps $2500 of expense) that are reactor-related. The balance of the part-time salary expense in this category is related to non-reactor projects and activities of the NEL.

8. Upon termination of the operations of the UCLA Research Reactor it will be necessary to shut down the facility and maintain it in a safe condition. In order to provide an estimate of the cost of safely shutting down the facility the applicant has proposed the deferred dismantlement mode of decommissioning with the mothballing mode as an alternative. Under deferred dismantlement the reactor will be mothballed with fuel removal and disposition. Core removal and total dismantlement will occur at least three years after the last reactor run. Under the mothballing mode the fuel will be removed and the reactor will remain a controlled radiation area under a possesion only license. Rockwell International Corporation estimated the cost for fuel removal at $233,300 with $35,400 required annually for maintenance and radiation monitoring. Total demolition of the facility will require an additional $308,000 plus $106,000 for planning, supervision, and health physics surveillance. Funding for these expenditures is expected to be provided through amounts budgeted to NEL by the University of California, Los Angeles Campus.

9. The University of California is a land grant college that is financially supported by:

   (a) appropriations from the California State Legislature:
   (b) contracts and grants; and
   (c) fees.

   There are nine campuses of the University and several laboratories.

10. This application pertains to the Nuclear Research Reactor on the Los Angeles Campus. To the extent that the Legislature supports the University of California, those monies are distributed to the campuses, and the portion received by UCLA is further distributed to the various Colleges, Schools, and Departments. For the fiscal year ending June 30, 1981 UCLA's budget was $692.1 million. Direct support of the Nuclear Reactor derives principally from the operating budget of the School of Engineering and Applied Science. For the same period, the School of Engineering and Applied Science had a budget of $19.3 million. UCLA provides further indirect support in administrative surveillance, and maintenance functions.

11. The UCLA School of Engineering and Applied Science (SEAS) supports, from its annual state funded operating budget, a broad range of academic programs in pursuit of the University's teaching and research mission. The UCLA Nuclear Reactor is one such program. Periodically, these programs are subjected to academic review by the faculty of the School. Based on these reviews, recommendations are made to the Dean for the continuing financial support. Subject to the availability of funds from the State of California, continuing positive recommendations by the faculty, and continuing programmatic need, the Nuclear Engineering Laboratory is expected to be funded at levels similar to those indicated below.

12. In addition to the SEAS appropriated support, the Nuclear Energy Laboratory derives funds by recharging other campus units for technical assistance provided to specific contracts and grants and by charging fees to both academic and non-academic users for reactor services. Support for the Health Physicist (who is budgeted out of the Office of Research and Occupational Safety) and for indirect costs (which are recovered for the campus as a whole) are not considered within the following sources of funds for NEL operations. The NEL does not regularly issue annual reports of a fiscal nature, but, the approximate distribution of fund sources for the past four (4) fiscal years is shown below.

NEL Sources of Funds

FISCAL YEAR: July 1st to June 30th

	1977-78	1978-79	1979-80	1980-81
SEAS Appropriation	$131,187	$127,636	$151,735	$189,724
Reactor User Fee Income	9,170	11,130	21,000	33,855
Non-Reactor Income	71,675	55,923	67,180	60,264
TOTAL SOURCES OF FUNDS	$212,032	$194,689	$239,915	$283,843

13. Initially funded under a grant from the Atomic Energy Commission in 1958, the UCLA research reactor has been in operation since 1960, a period of 20 years, by the University of California at its Los Angeles campus. The present application is to review the operating license to allow for another twenty-year period of operation. While the foregoing estimate of costs to operate the facility (paragraph 7) includes all costs directly resulting from the facility's operation and a substantial amount of indirect costs, it does not include every possible indirect cost attributable to run the reactor.

14. Nevertheless, the Nuclear Energy Laboratory budget is a minor component of the amount budgeted for the School of Engineering and Applied Sciences, which in turn is a nominally small amount in comparison to that budgeted for the Los Angeles campus, let alone the entire University of California. Accordingly, any additional amounts that could be attributed as indirect costs to operate the research reactor would be considered relatively insignificant.

15. Indeed, as the University of California could be appropriately described as one of the largest state operated educational institutions in the United States, its financial resources are very substantial. Consequently, one can only conclude that there exists no reasonable question as to the University's ability to obtain the amounts necessary to operate the research reactor, especially when the funds necessary to operate it have been appropriated by the University's Board of Regents every year over the last 20 years.

16. It is also significant that the University has had a balanced budget every year over the last twenty years, that is, it's disbursements have never exceeded its receipts, thus never causing the University to incur an operating deficit.

17. Finally, continued funding of the costs necessary to operate the research reactor is a prerequisite to its continued operation. Should funding terminate for the reactor's operation, the NRC would either suspend or revoke the University's license to operate the facility and allow a "possession only" license.

18. Based upon the Applicant's status as a state operated educational institution, the size of its operations, its demonstrated ability to achieve revenues sufficient to cover the UCLA research reactor's operating costs for the last 20 years, and its successful history of obtaining capital, it is my opinion that the University of California is financially qualified to operate the UCLA research reactor facility and has reasonable assurance of continuing to obtain the necessary funds for operating costs and for costs of permanent shutdown and safe maintenance, according to the requirements of 10 CFR § 50.33(f).

I attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Michael L. Karlowicz, Jr.

Subscribed and sworn to before me
this _____day of _____ 1982.

_____
Notary Public

My Commission expires:

CONTENTION XIX[1/]

The assertion that the application contains no analysis of a maximum credible accident or design basis accident contradicts Contention VIII which challenges the credibility of the analysis of the postulated accident in the application. Thus, the assertion here, that the application contains no accident analysis is obviously untrue. Secondly, the applicant has withdrawn its original hazards analysis, as indicated in the discussion of Contention VIII, so that now the application rests on the two NUREG generic studies of postulated accidents at Argonaut reactors and analysis of the maximum credible accident by the Applicant. Therefore, the assertion that no analysis of a maximum credible accident has been done for the UCL A reactor is totally without basis in fact.

As is readily apparent, this contention raises four issues of different postulated accidents at the UCLA facility under the umbrella of a "flawed" hazards analysis in the application for license renewal. Intervenor opines that the facility license may not be renewed unless these four postulates are considered.

1/ XIX. The application's Safety Analysis is flawed because it does not include an analysis of the "maximum credible accident" or a "design basis accident." In providing such an analysis the following hazard scenarios for this facility have not been considered:

1. Sabotage, such as explosives being thrown at or placed on the reactor itself, causing major damage and broken fuel plates.
2. Airplane crash such as a DC-10 or Boeing 747 scheduled to arrive at LAX or Burbank airports crashing into the reactor room, or into the void area above the reactor, causing the building or portions thereof to collapse breaking apart fuel assemblies and releasing radiation.
3. Multiple failure mode - worst possible series of events.
4. Operator error which leads to design basis accidents.

No bases are cited in the Supplemental Contentions (pp. 129-30) to support the Intervenor's opinion that such postulated accidents are credible. The only reason stated by Intervenors for asserting the necessity of such accident analysis is that the reactor is located in a highly populated area, has no containment, and is operated as a (student) training facility. This is of course, a non-sequitur. The site, construction, and use of the UCLA reactor has no connection to the probability of the accidents listed. Additionally, a later submission by the Intervenor, ostensibly to provide a basis for asserting the possibility of a heavy plane crash onto the reactor building, consists of one page of statements alleged by Intervenor to have been made by an FAA official (to an unidentified person) to the effect that there are no scheduled overflights of UCLA but that weather sometimes requires planes to fly holding patterns and that the planes "could go over UCLA." This is, of course, only a speculation and not enough to provide a basis to believe that a heavy airplane crash onto the UCLA reactor is a real concern. Thus, it is abundantly clear, that Intervenor provided no basis for this assertion and that it is nothing more than an unsupported allegation.

CBG responses 90-96 to Staff interrogatories provide nothing more than the Supplemental Contentions. Intervenor admits to a total lack of evidence to support this contention but once again describes a fanciful "disaster" consisting of no scientific facts, no calculations, no explanations of how the accidents or sabotage could occur, and no indication of any reason to believe the various scenarios postulated by the authors of the discovery responses. (See Response A(a) to Staff interrogatory). In short, no basis

or reason has been provided in support of this contention so that it is simply a matter of the Intervenor's unfounded speculation. On this basis alone the contention should be dismissed.

Nevertheless, the attached affidavit of Harold Bernard sets out the consequences of each of the four postulated accidents in this contention, showing that there is no potential harm to the public from any accident described.

As pointed out by Mr. Bernard (pp. 1-2, paras. 6-7), damage to the reactor and its irradiated fuel from explosives would be no worse than the damage postulated in the Staff analysis of severe earthquake damage in Section 14 of the SER which is based on analyses by the Battelle and Los Alamos Laboratory studies referenced therein. Similarly, the crash of a heavy aricraft onto the reactor building would cause no more damage than the postulated earthquake. (Bernard, para. 8). Given the simple mechanism of the Argonaut-UTR reactor at UCLA (See SER Sections 1-2; 3-4; 4-5; 5; 6 and 7), the worst case "multiple mode failure" at the UCLA facility would be simultaneous failure of the dump valve and control rod drive mechanism, which would result in boiling of the moderator-coolant, evaporation of the water and resultant reduction of reactivity so the reactor would be sub-critical (Bernard, para. 9). As to operator error leading to an accident, there is no possibility that such could occur because of inherent control safeguards and the simple design of the control panel. (Bernard, para. 10). As discussed previously in connection with Contention II, the UCLA reactor is an Argonaut-University Training Reactor (UTR). It was designed to provide students with a safe means of learning reactor controls and operation. (See Battelle study, p. 1). Logic dictates that a reactor designed

to train students in handling its controls will not be vulnerable to an accident caused by operator error. Experience dictates that students err during the learning process. Thus a "design basis accident" caused by "operator error" at a training reactor is a contradiction in terms and a factual impossibility.

Therefore, because Intervenor has provided no basis in fact or reason to support the postulated accidents in this contention; because discovery has shown the Intervenor could offer no evidence pertinent to any part of this contention; and because the affidavit of Harold Bernard, the accident analyses in Section 14 of the SER, and the two referenced laboratory studies and analyses of postulated accidents at Argonaut reactors (Battelle and LANL) show conclusively that there is no issue of material fact which could be litigated concerning this contention, the Staff submits Contention XIX must be dismissed by summary disposition as a matter of law.

IV. CONCLUSION

For the reasons stated above the Board should grant the motion for summary disposition of Contentions I, II, III, IV, V, VI, VII, VIII, IX, X, XII, XIII, XIV, XV, XVI, XVII, XVIII and XIX.

Respectfully submitted,

Colleen P. Woodhead

Colleen P. Woodhead
Counsel for NRC Staff

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)	)	

AFFIDAVIT OF HAROLD BERNARD
REGARDING CONTENTION XIX

STATE OF MARYLAND)
COUNTY OF MONTGOMERY) SS

I, Harold Bernard, being duly sworn do depose and state as follows:

1. I am employed by the U.S. Nuclear Regulatory Commission in the Office of Nuclear Reactor Regulation, Division of Licensing, Standardization and Special Projects Branch (SSPB). My professional qualifications are attached to my affidavit regarding Contention I.

2. I am the Staff project manager for the UCLA Research Reactor and am responsible for obtaining appropriate Staff review of all the licensing activities associated with the UCLA facility, and in particular, for review of the application for license renewal by the Regents of the University of California for the UCLA reactor.

3. The purpose of my affidavit is to address the issues raised by Committee to Bridge the Gap in Contention XIX, which I have read in its entirety.

4. I have reviewed all the information submitted by UCLA in its license renewal application and have requested and received NRC technical reviews of the application for inclusion in the Safety Evaluation Report, part of which I have personally written.

5. I have directed NRC consultants in specific studies of the Argonaut reactor design and operation for Staff use.

6. Because of the heavy concrete shielding surrounding the reactor, externally placed explosives detonated during reactor operation would constitute no greater effect on the reactor than the effects of the severe hypothetical earthquake accident analyzed in the SER. This

latter event produced no melting of the core and no significant exposure due to fission product release.

7. Sabotage with the shielding blocks off would involve decay time commensurate with the 2-4 days required to remove the shielding blocks. This accident event would produce lower doses than calculated in the above-mentioned earthquake event.

8. Section 14 of the SER analyzes the consequences of the collapse of Boelter Hall and the concrete shield onto the reactor and demonstrates that no threat to public health and safety from radiological releases would occur. This analysis is applicable to the crash of a heavy aircraft into Boelter Hall, since such a crash would do no greater damage to the structures than that assumed in the SER accident analyses. In addition, as stated in the SER, no commercial flight paths occur over UCLA.

9. The worst case multiple mode failure at the UCLA reactor would be a simultaneous failure of the dump valve and control rod drive mechanism prohibiting control blade drop at 100 Kw power operation. In this case, boiling of the primary coolant and resultant evaporation would occur. This would reduce reactivity levels because of loss of the moderator so that fission would cease as in a normal scram.

10. Because of several instrumental control and safety systems described in Technical Specification 3.2, and the inherent safety and simplicity of the design of the reactor and control panel, there is no operator error which could lead to a serious accident at the UCLA reactor.

11. In my opinion, no risk to health and safety from radiological releases would occur from detonation of explosives, a heavy aircraft crash, a multiple mode failure or operator error at the UCLA research reactor.

I hereby attest that the foregoing affidavit is true and correct to the best of my knowledge and belief.

Harold Bernard

Subscribed and sworn to before me
this 14th day of September, 1981

Notary Public

My Commission expires: [illegible]

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 Nos. 50-142
	)	
	)	(Proposed Renewal of Facility License)
	)	
(UCLA Research Reactor)	)	

STATEMENT OF MATERIAL FACTS AS TO WHICH
THERE ARE NO GENUINE ISSUES TO BE HEARD

Contention I

1. The original operating license for the UCLA research reactor was issued in 1960 and renewed for a term of 10 years in 1971.
2. The application submitted by the University of California for renewal of the UCLA research reactor license was reviewed for sufficiency by the Staff prior to docketing in 1980.
3. The vibration test referenced on page II/3-1 of the application is fully reported and available in scientific literature.
4. The results of the vibration test were reported to the NRC in 1968.
5. The accident analysis in Appendix III of the amended application was recently performed by the UCLA Staff.
6. The 1974 AEC environmental analysis of research reactors referenced in the application remains valid.
7. Reference to generic safety studies in applications is permissible under the Commission's regulations.

8. There is no requirement by the Commission that applications contain solely original studies and analyses.
9. The UCLA research reactor is used for more than 3000 student hours of instruction for eight engineering and physics courses.
10. The UCLA reactor was not significantly affected by the 1968 vibration test or a 1971 earthquake in the Los Angeles area.
11. The technical specifications in the Application contain only minor changes from the present ones.
12. No releases to groundwater would result from the maximum credible accident at UCLA.
13. Presence of deep wells on the UCLA campus is not a significant fact for licensing the research reactor.
14. A maximum credible accident would not result in releases to the public in excess of 10 C.F.R. Part 20 limits.
15. The use of another University research reactor at a different campus would seriously impede the effectiveness of the UCLA nuclear engineering and physics department.
16. Experimental tests showed step insertions of $3.90 will not adversely affect the Argonaut UTR.
17. Docketing of an application by Staff indicates that sufficient information has been provided to begin review.

Contention II

1. Less than 2% of the costs of owning and operating the UCLA reactor was incurred from non-academic activities during 1971-81.

2. The direct costs to UCLA for use of the research reactor for the fiscal year 1980-81 were $224,000.
3. The 1980-81 total direct and indirect costs for operating the UCLA reactor were $337,958.
4. The costs to UCLA for commercial uses of the research reactor for the fiscal year 1980-81 were $3,000.

Contention III

1. The Commission's inspection and enforcement record for UCLA since 1975 shows no violations of safety significance.
2. The annual reports by UCLA to the Commission show no occurrence of safety significance.
3. All notices of violation issued by the Office of Inspection and Enforcement to UCLA cite minor deficiencies and infractions without safety significance.
4. UCLA has taken adequate corrective actions in response to all notices of violation.
5. The Commission's records concerning operation of the UCLA research reactor show no evidence of inadequate management or administration which raise a concern for public health and safety.
6. Unlicensed visitors to the UCLA research reactor have been allowed to manipulate the reactor controls only under the direct supervision of licensed operators as permitted by 10 C.F.R. § 55.4(d).
7. The UCLA reactor facility has been inspected at least annually by NRC inspectors for more than 20 years.

Contention IV

1. Only five items of non-compliance with minor technicalities have been cited against UCLA since 1975.

2. The inspection record for UCLA shows no items of significant non-compliance with Commission regulations or the UCLA technical specifi-cations.

3. Appropriate actions have been taken by UCLA to correct all items of non-compliance.

4. All licensee corrective actions described in responses to notices of violation are verified by NRC inspectors.

5. The Commission's records show that the UCLA research reactor has operated for 20 years without an incident posing risk to public health and safety.

Contention V

1. Neither step insertion of 2.6% Δ k/k ($3.90) excess reactivity nor prompt criticality would produce fuel melting at the UCLA research reactor.

2. The available excess reactivity in Argonaut reactors is not sufficient to cause fuel melting.

3. The $3.00 amount of excess reactivity allowed by the UCLA technical specifications is well within the margin of safety and poses no threat of fuel melt.

4. The graphite temperature coefficient in the Argonaut affects reactivity more slowly than the negative water temperature coefficient.

5. The negative worth of the control blades in an Argonaut reactor can compensate for an amount of positive graphite temperature coefficient equal to the negative water temperature coefficient.
6. The increase in power level from 10kw to 100kw in 1963 at the UCLA research reactor required only a trivial increase in excess reactivity, and no greater likelihood of a power excursion leading to fuel melt.
7. Only a few elements or isotopes in significant quantities could affect reactivity if inserted into the reactor by the pneumatic sample ("rabbit") system.
8. All experiments at UCLA are subject to prior review and approval by the Reactor Use Committee or the Supervisor and Health Physicist and technical specification limits in Section 3.5 of the Technical Specifications.

Contention VI

1. The 10 C.F.R. Part 20 Appendix B release limit for unrestricted areas for ^{41} Ar is 4×10^{-8} μ Ci/ml.
2. The ^{41} Ar releases from the UCLA reactor into unrestricted areas are 3.8×10^{-9} μ Ci/ml.
3. The UCLA radiation monitoring system data has been verified by an environmental monitoring program.
4. The most conservative interpretation of the UCLA environmental monitoring program is 30 mrem/yr from reactor radiological releases into unrestricted areas.

5. A dose of 30 mrem/yr. is 6% of the permissible radiation level in 10 CFR § 20.105(a).
6. The radioactive emissions from the UCLA research reactor could not be significantly reduced by additional stack height.

Contention VII

1. The causes and corrections of all events termed abnormal occurrences and unscheduled shutdowns at UCLA have been investigated by NRC inspectors.
2. Unscheduled shutdowns are common at research reactors used in student training.
3. No accidents have occurred at the UCLA reactor causing damage to property or harm to persons.
4. No events posing a threat to public health and safety have occurred at the UCLA research reactor during its twenty years of licensed operation.
5. Reliability of reactor operation is not part of the Commission's regulatory responsibility absent a safety consideration.

Contention VIII

1. The Safety Analysis Report submitted with the 1980 UCLA application for the second license renewal rests on the assumption that fuel melting has occurred.
2. Fuel melting cannot occur in an Argonant-UTR reactor limited to $3.00 excess reactivity and 100 kw power level.
3. An inadvertent stepwise insertion of $3.90 excess reactivity would produce a fuel temperature of 500°C with possible hot spot of 590°C.
4. The aluminum fuel cladding of the UCLA fuel plates melts at 660°C

and the fuel meat melts at 640°C.

5. The extremely conservative analysis in the UCLA SER of a worst case accident which crushed the reactor core so that 750 guillotine breaks in the fuel plates occurred, resulted in a calculated release of fission products inside the reactor room causing a dose of 0.047 rem, whole body, and 30 rem to the thyroid.
6. The only chemical reaction which could produce an explosion in the UCLA reactor core is a metal-water reaction between the aluminum in the fuel plates and the coolant water, and resulting hydrogen gas formation.
7. For a metal-water reaction to occur, the aluminum cladding in the fuel plates must be broken down into aluminum filings.
8. No credible mechanism could reduce the fuel plate cladding into filings at an Argonant-UTR.
9. A graphite fire in the UCLA reactor would occur only if an experiment failed and a general building fire occurred and the reactor's graphite blocks were exposed to a free flow of air.
10. Severe damage to fuel plates due to a fuel handling accident at the UCLA reactor would not produce doses inside the reactor room above 2 rem whole body and 43 rem, thyroid.

Contention IX

1. A calibration error made in 1975 by UCLA reactor personnel has been corrected and has not been repeated.
2. Written procedures for calibration of intruments at the UCLA facility have been developed and reviewed by the Radiation Use

Committee.

3. Appropriate actions have been taken by UCLA to correct all items of non-compliance.
4. Calibration errors at the UCLA reactor facility have not been significant to public health and safety.
5. The calibration of instruments and maintenance of equipment at the UCLA reactor facility has been inspected by NRC for many years.
6. No risk to public health and safety has arisen from inadequate equipment maintenance at the UCLA reactor facility.

Contention X

1. The maximum credible accident at the UCLA research reactor would result in doses within the reactor room of less than 2 rem whole body and 43 rems to the thyroid.
2. The gaseous effluent dose from normal operation of the UCLA reactor is 1.4 mrem/year.
3. The dose monitored inside the UCLA reactor room during full power operation is 1 mrem/hour.
4. Only one 700 gm spent fuel shipment has been made by UCLA since obtaining its license in 1960.
5. Low level solid waste created at the UCLA facility is less than $0.5m^3$ annually.
6. Low level liquid waste at the UCLA facility is monitored and passed through a 225 gallon 10 minute delay tank and released to city sewer or storm drains in concentrations less than 10 CFR Part 20, Appendix B limits.
7. Secondary coolant discharges are not more than 30° above the city water supply temperatures.
8. The UCLA research reactor operates a maximum 8.5 hours per week.

9. The UCLA research reactor is licensed to operate at power levels up to 100 KW.
10. No new construction is proposed by the UCLA application for license renewal.
11. About 60,000 gallons of city water per month is used by UCLA for the reactor.
12. The amount of U^{235} used by UCLA since 1960 was 700 gm.

Contention XII

1. No significant releases would result from the maximum credible accident at the UCLA research reactor.
2. Containments at power reactors are constructed to prevent release of highly radioactive effluents in the event of accident.
3. The inherent safety of the Argonant UTR reactor requires only structural housing.
4. The reactor building is kept at negative pressure by an exhaust fan of 14000 CFM.
5. The stack monitor at the UCLA reactor serves as a back-up for the high radiation monitor system.
6. Boron injection systems, radioactivity removal systems, emergency holding tanks, HEPA filters, emergency core cooling systems and spare motors are not necessary for safe operation of Argonaut UTR research reactors.
7. Water is the moderator in an Argonant UTR.
8. Loss of coolant water in an Argonaut results in termination of fission.
9. The characteristics of the Argonaut UTR are an inherently safe design, low operating temperatures and low radiation effluent levels.

10. The concrete biological shield surrounding the UCLA Argonaut UTR effectively protects persons in the reactor room from significant exposure.
11. An interlock system at the UCLA reactor facility would not increase safety since reactor room radiation is 1 mr/hr.
12. The UCLA research reactor has no turbine or other component which could create missles.
13. The control blades at the UCLA research reactor are not subject to the force necessary to become missiles.
14. Any increase in positive graphite reactivity in an Argonaut-UTR would be minimal in relation to the negative worth of the reactor coolant.
15. The inherent design safety; low power part time operation; and effluent monitoring at the UCLA research reactor preclude risk from fuel failure.
16. The control blades at the UCLA research reactor have performed safely for twenty years.
17. If damage occurs to control blades at Argonaut UTRs they may be safely repaired or replaced.
18. The Argonaut UTR may be safely shut down without control blade operation by dumping the moderator coolant water.

Contention XIII

1. The 93% enrichment level of fuel in use by the UCLA reactor is necessary to maintain the optimum flux because of the reactor design.
2. The amount of SNM at the UCLA reactor facility is less than 5 kg.
3. No low-enriched fuel plates sufficient for the Argonaut UTR design are available.

4. Some excess reactivity is required at an Argonaut UTR to overcome inherent neutron reaction poisons, burnup trade-offs, personnel safety in fuel manipulations and negative reactivity experiments.
5. The UCLA reactor excess reactivity limit in the proposed technical specifications is $3.00.
6. A $3.00 excess reactivity limit provides a conservative margin of safety.

Contention XIV

1. No significant safety problems in Argonauts have developed in 20 years of operation.
2. The positive graphite temperature coefficient in an Argonaut is produced by heat transferrence.
3. Heat transferrence to graphite in Argonauts occurs only after several hours of operation.
4. The Argonaut secondary water system is designed on a site specific basis.
5. The secondary coolant for an Argonaut does not come into contact with the primary coolant.
6. The secondary coolant system of an Argonaut has higher pressure than the primary system.
7. If the secondary coolant system pressure is insufficient to maintain core cooling, the increase in temperature will decrease the power level in an Argonaut-UTR.
8. In the event of primary coolant boiling, the Argonaut reactor will shut down due to loss of moderator from evaporation.

9. In the event of loss of all water in an Argonaut during operation, the residual decay heat would not be sufficient to cause fuel melting.
10. In the event of failure of control blade motors at the UCLA reactor, the control blades would fall into the core by force of gravity.
11. Inability to withdraw control blades from the UCLA reactor core maintains shutdown.
12. Research concerning Argonauts demonstrates no generic safety problems because of the reactor design and composition.

Contention XV

1. The maximum credible accident at the UCLA research reactor would not produce significant radiological releases outside the reactor building.
2. The dose limits in 10 CFR § 20 for releases into unrestricted areas are based on doses to the individual.
3. The number of persons in the nearby population is not relevant to Part 20 calculations.
4. The accident considerations for research reactors are based on dose calculations in 10 CFR Part 20.
5. The addition of classroom and office buildings near the UCLA reactor has no affect on individual dose limits in 10 CFR Part 20.
6. The maximum dose to an individual in a nearby classroom from the UCLA reactor radiological releases is 1.0 mrem/yr.

Contention XVI

1. The UCLA technical specifications require the equipment at the UCLA reactor to be regularly inspected, maintained, repaired and replaced.
2. Reactor components are commonly fabricated at machine shops.
3. The UCLA reactor operates an average 8.5 hours per week.
4. The UCLA reactor has operated the equivalent of one year of full time operation since 1960.
5. The low power level and part time operation of the UCLA reactor do not produce a significant amount of component wear.
6. Power reactors are licensed for 40 years of full time, high power operation.
7. The Commission's regulations require compliance with performance criteria for reactor components.

Contention XVII

1. It is well known that California is a seismically active area.
2. The SER § 14 analysis of possible damage to the UCLA reactor as a result of a severe earthquake shows such damage would produce a dose of less than 1 rem.
3. The SER analysis of hypothetical damage to the UCLA reactor from earthquake rests on the assumptions that the reactor is operating at 100 KW; that the fission product inventory is that reached at 100 KW; a loss of coolant has occurred; the core is crushed in vertical or horizontal axes, and 10,5000cm^2 of fuel surface is exposed as if 750 guillotine breaks in fuel plates had occurred and 100% of the gaseous activity produced in the recoil range of the particles

instantaneously escapes from the fuel containing the maximum inventory.

4. The UCLA reactor does not operate for long enough intervals to achieve fission product equilibrium for fission products of safety concern.
5. Complete breaks in fuel cladding release fission products more rapidly than fractures.
6. In the event of collapse of all structures surrounding the UCLA reactor, some plate-out or mixture of the radioactive iodines with water, vapor and rubble would occur.
7. The complete collapse of both Boelter Hall and the UCLA reactor's biological shield is a remote possibility.
8. It is unlikley that the UCLA reactor core would suffer damage equal to 750 guillotine breaks as a result of a severe earthquake.

Contention XVIII

1. The University of California has obtained funds from the State Legislature sufficient to safely operate the UCLA research reactor for twenty years.
2. The UCLA research reactor has been maintained in safe condition for twenty years.
3. The 1980-81 total direct and indirect reactor operating costs for the UCLA research reactor were $337,958.
4. The estimated cost of "mothballing" the UCLA reactor upon decommissioning is $233,300 for fuel removal and $35,400 annually for maintenance and radiation monitoring.

5. For the fiscal year 1981, the funds distributed to UCLA from the Regents of the University of California was $692.1 million.
6. The funds provided by UCLA to the School of Engineering and Applied Sciences for 1981 were $19.3 million.
7. The funds received by the Nuclear Engineering Laboratory (NEL) in 1980-81 totaled $283,843.
8. The direct costs of operation of the UCLA reactor for 1980-81 were $224,000.
9. Indirect financial support is provided to NEL by UCLA.
10. The University of California is one of the largest state operated educational institutions in the United States and has very substantial financial resources.

Contention XIX

1. The SER § 14 analysis of the consequences of the collapse of the Boelter Hall Classroom building and collapse of the UCLA reactor biological shield which crushes the core resulted in finding radiological releases would not exceed 10 C.F.R. Part 20 limits.
2. The most serious common mode failure possible at the UCLA reactor is a simultaneous failure of the coolant dump valve and control blade insertion.
3. The simultaneous failure of the coolant dump valve and control blade insertion would result in loss of moderator due to evaporation from boiling.
4. Loss of coolant water-moderator in an Argonaut results in loss of fission.

5. The design of the Argonaut control panel is such that operator error causes reactor scram.
6. The Argonaut controls are designed to compensate for student error.
7. The SER § 14 Analysis of severe core damage is equivalent to damage possible to the UCLA reactor from a heavy aircraft crash, or explosives placed in the reactor by a saboteur.
8. A credible accident at the UCLA research reactor is a fuel handling accident.
9. The UCLA proposed technical specification 3.6.3.4. prohibits fuel handling prior to 21 days of shutdown condition.
10. Twenty-one days of decay time reduces fission product inventory significantly.
11. The accident analysis in the UCLA Application concludes that doses of 0.2×10^{-3} rem (whole body) and 1.58 rem (thyroid) would be produced within the reactor room from a fuel handling accident.

Atomic Safety and Licensing Appeal
Panel (5)*
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Docketing and Service Section ( )*
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Robert M. Meyers
City Attorney
Sarah J. Shirley
Deputy City Attorney
1685 Main Street,
Room 310
Santa Monica, CA 90401

Colleen P. Woodhead
Counsel for NRC Staff

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)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF MOTION FOR SUMMARY DISPOSITION," in the above captioned proceeding have been served on the following by deposit in the United States mail, first class, or as indicated by an asterisk, through deposit in the Nuclear Regulatory Commission's internal mail system, this 1st day of September, 1982.

John H. Frye, III, Chairman
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. Emmeth A. Luebke*
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. Oscar H. Paris*
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Committee to Bridge the Gap
1637 Butler Avenue, #203
Los Angeles, CA 90025

William H. Cormier, Esq.
Office of Administrative Vice Chancellor
University of California at Los Angeles
405 Hilgard Avenue
Los Angeles, CA 90024

Mr. John Bay
3755 Divisadero #203
San Francisco, CA 94123

Christine Helwick, Esq.
Glenn R. Woods, Esq.
Office of General Counsel
2200 University Avenue
590 University Hall
Berkeley, CA 94720

Roger Holt, Esq.
Office of City Attorney
200 North Main Street
City Hall East, Room 1700
Los Angeles, CA 90012

Daniel Hirsch
Box 1186
Ben Lomond, CA 95005

Nuclear Law Center
c/o Dorothy Thompson
6300 Wilshire #1200
Los Angeles, CA 90048

Atomic Safety and Licensing Board Panel*
U.S. Nuclear Regulatory Commission
Washington, DC 20555