

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

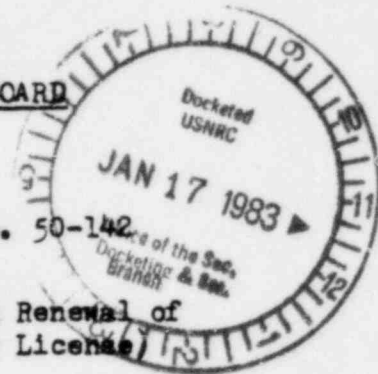
In the Matter of

THE REGENTS OF THE UNIVERSITY
OF CALIFORNIA

(UCLA Research Reactor)

Docket No. 50-142

(Proposed Renewal of
Facility License)



DECLARATION OF DR. SHELDON C. PLOTKIN AS TO CONTENTION XVI

I, Sheldon C. Plotkin, do declare as follows:

1. I am President of S.C. Plotkin and Associates, a consulting engineering firm specializing in safety and systems engineering. A statement of professional qualifications is attached to my declaration for Contention I.
2. I serve on the Executive Committee of the Southern California Federation of Scientists, and have participated in and coordinated the activities of the SCFS review group assessing reactor safety matters related to the UCLA reactor, particularly with respect to providing technical assistance to the Committee to Bridge the Gap in responding to Staff and Applicant motions for summary disposition.
3. That review has included site visits to NEL and its environs; inspection of wiring diagrams, equipment manual, calibration and maintenance records, engineering change orders, operating logs, and detailed physical inspection of the reactor and the control panel electronics.
4. The purpose of this declaration is to respond to the Staff and Applicant motions for summary disposition as to Contention XVI.
5. It is concluded based upon the above review that the reactor is indeed suffering numerous deleterious effects from age, the lack of availability of spare parts and adequate funds for and attention to maintenance. The design is seriously outmoded, being essentially of vacuum tube vintage, and basic modern electronic features that would enhance reliability are lacking.
6. The fact that the technical specifications require regular maintenance of the equipment is irrelevant to the safety analysis for the facility, because a review of the inspection report and maintenance records indicate a consistent pattern of failing to do the necessary maintenance, despite requirements to the contrary.

In particular, review of the maintenance records indicates most maintenance is of the fix-it rather than prevent-it variety. Generally failure of equipment appears to be necessary to undertake what should have been routine preventive maintenance; in some cases, particularly evidenced in the scram reports, particular devices failed and failed and failed before repairs or maintenance was undertaken. There are numerous discussions in the records of how maintenance or repair should be done, but can't for lack of funds.

7. Much of the continual equipment failure can be traced to age, in addition to the lack of proper maintenance. Keeping the Argonaut reactor operating appears to be a bit like keeping an old bi-plane or Model T or Edsel operating--spare parts are extremely difficult to obtain, and a great deal of makeshift wiring and repair is done to keep old unreliable parts at least somewhat functional because of the difficulty in ever replacing it should it finally and totally fail.

8. The argument that the 22-year-old reactor is the equivalent of only 1 year old because of its part-time operation is falacious. In fact, because the UCLA reactor is constantly being turned off and on (brought up to critical and scrammed and a few hours later back to critical, and so on), the wear and tear is far greater than a device that has functioned steadily for longer times. (The expected lifetime of a lightswitch, for example, constantly being turned on and off is far less than that of one that remains on, even if for a longer period of time).

9. It is clear from an inspection of the facility that a significant amount of component wear and tear has already taken place and that continued maintenance of the aging and outdated equipment is very difficult. It is hard to imagine how the facility could be safely maintained for twenty more years in the absence of a reliable vendor or complete overhaul.

10. The Staff analogy to power reactors is fallacious. Forty years of operation, with very large budgets for maintenance and repair, and reliable sources of supply, with vendors present through the lifetime of the facility to provide support and parts, for a power reactor does not mean that the UCLA reactor, with its constant on-off operation (e.g., cycling of control blades orders of magnitude more often than in a power reactor) and lack of reliable supplier, can be adequately maintained for decades. There are only two other reactors in this country of the same type, made by AMF, and two other similar reactors made by American Standard Sanitary and Radiator Company, neither of which still are in the business. There obviously is not going to be much of a business for spare parts to Argonaut reactors.

11. An examination of the electronics makes the seriousness of the age problem clear. The electronics are almost exclusively vacuum tubes, very hard to maintain and replace, or even to find technicians still trained to maintain tube systems. The difficulty of replacing components has led to such makeshift efforts as using Heathkit or Radioshack parts, certainly not of the reliability necessary for reactor components.

12. On June 30, 1982, while the ASLB was touring the facility, I was permitted to inspect the console equipment. That morning, unbeknownst to me and not reported to me as I began my inspection, a reportable occurrence had occurred at the facility, with the operator unable to take the reactor critical due to the constant engagement of the auto controller.

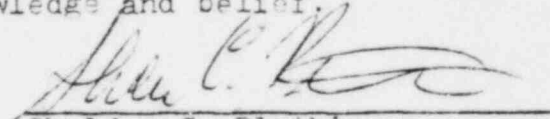
13. Nonetheless, without being notified of the control failure of a few hours earlier, my observations indicated numerous problems associated with age and poor maintenance. Numerous "add-on" modifications are attached to the equipment frame rather than installed as an integrated part of the equipment. A multitude of unconnected wires are visible, e.g. loose lamp cords, a-c sockets, connection wires. A relay circuit in an octal socket is simply mounted in a 3/4 inch thick piece of wood and attached to the equipment frame by only one simple "C" clamp. The start-stop key mechanism is connected to a very flimsy pastic-type level and flimsy plastic switch mechanism.

14. Some equipment was very old while some was relatively new. There is a safety problem with the older equipment; a prime example in the mechanical area is the corroded sump pump which has presented some special problems.

15. The console equipment is not fail-safe. Proper operation of the safety systems require in several cases activation not by electronic signal but by mechanical motion of pen recorder sets of the type that are prone to sticking. Improper calibration of safety sensors likewise presents numerous opportunities for conditions over safety limits to arise but the trip mechanism not to operate because the monitor did not accurately record the true situation. Protection against corrosion of the fuel and high radiation level protection systems are particularly in this category.

16. In conclusion, examination of the reactor equipment and electronics, review of the very old equipment handbooks and wiring diagrams, and inspection of maintenance records and engineering change orders indicate safety problems associated with the aging, deteriorating, and outmoded condition of the reactor and supporting equipment. Maintenance appears to have been sketchy, makeshift, and otherwise irregular and inadequate; considerable evidence was seen of makeshift repairs because of lack of availability of spare parts. The records and physical examination further indicate that needed maintenance has been deferred, in many cases, according to documents such as the RUC minutes, because of lack of funds. The above age and maintenance problems have substantial safety significance, and increase the risks associated with continued operation of the reactor.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.


Sheldon C. Plotkin

Executed at Los Angeles, California, this 12th day of January, 1983

CONTENTION XVII

RESPONSE TO NRC STAFF STATEMENTS OF FACTS

1. NOT DISPUTED
2. DISPUTED (Aftergood on VIII full declaration; Kaku, P65-70, 83-4)
3. NOT DISPUTED THAT THOSE ARE THE ASSUMPTIONS USED IN THE SER
4. NOT DISPUTED *
5. DISPUTED (Kaku, P66)
6. NOT DISPUTED *
7. DISPUTED (Cort study, p. 2; Flotkin declaration P 18, in CBG motion for summary disposition as to the seismic contention, and the attachments thereto)
8. DISPUTED (Battelle study, p. 26; Kaku declaration, P65-70,83)



RESPONSE TO UCLA STATEMENT OF FACT

26. DISPUTED (Dupont declaration, P26-30)

* CBG notes that both are vague, however; e.g., how much is "some" plate-out,

CONTENTION XVIII

RESPONSE TO NRC STAFF MATERIAL FACTS

1. DISPUTED (Plotkin declaration as to XVII 5,16; Docket 50-142)*
2. DISPUTED (Plotkin declaration as to XVI P5-16; Plotkin as to III, P iv)
3. NOT DISPUTED
4. NOT DISPUTED
5. NOT DISPUTED
6. NOT DISPUTED
7. NOT DISPUTED
8. NOT DISPUTED
9. NOT DISPUTED
10. NOT DISPUTED

counter-facts:

- a. The fact that UC has "substantial financial resources" has no bearing on funds available to operate the reactor. (Baefsky on XVIII, at P6)
- b. The size of the UC budget is one of its primary financial liabilities at present. (Baefsky at P6)
- c. UC's funding source, the State of California, faces a \$1.5 million deficit in "the gravest fiscal crisis in state government since the end of the Great Depression." (Baefsky at P7)
- d. UC has been racked by deep cuts for each of the last few preceding years. (Letter, 11/1/82, Jesse Shaw, UC Associate Director of the Budget)
- e. On January 3, 1982, Governor Deukmejian cut the current UC budget by 2%. (Baefsky, P 7)
- f. UC President Saxon has estimated the State deficit could result in cuts of up to \$55 million in UC operations for this year and an additional \$100 million next year. (Baefsky, P8).
- g. President Saxon has estimated the effect of a \$100 million cut as the equivalent of closing all 24 UC schools in engineering, business, agriculture, law, public health, nursing and education, or closing two of the smaller of the nine UC campuses completely. (Baefsky at 8; Bruin 11/22/82)
- h. The reactor, because of its limited instructional and research functions, is a high priority for significant budget cuts. (Baefsky, P 9)
- i. A universitywide review committee on engineering has already listed the Nuclear Engineering program at UCLA as of low cost effectiveness and low enrollment and recommended consolidation with other UC programs. (Baefsky, P 9, and attachment).

j. the reactor is likely to experience significant budget cuts because of the UC budget crisis and the dwindling instructional and research uses for the facility. (Baefsky, P 9)

k. The UC and State budget crisis and its likely effect on reactor budget is analyzed in either the application or the Staff review of the Applicant's financial situation. (Staff and Applicant motions for summary disposition on contention XVIII; Application)

l. In the absence of a thorough examination of the current financial crisis for University and the State, reasonable assurances of adequate funding for the reactor in the future have not, and cannot be provided. (Baefsky, P 11)

RESPONSE TO UCLA STATEMENT OF MATERIAL FACTS

6. NOT DISPUTED

7. NOT DISPUTED

8. DISPUTED (Baefsky declaration on XVIII, P4-11)