

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 XIV

I, Sheldon C. Plotkin, 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 included site visits; examination of the available drawings, electronic, architectural, and mechanical; the application and related documents and analyses; and an examination of operating logs, Radiation Use Committee minutes, maintenance logs, and the like.
4. The purpose of this declaration is to respond to the Staff and Applicant motions for summary disposition as to Contention XIV.
5. The contention in question essentially alleges that an inadequate review of safety problems potentially common to reactors of the UCLA type has been conducted. For other kinds of reactors, the nuclear industry and the NRC have a system for notifying operators of similar reactors of problems identified at other facilities, so that corrective actions or increased surveillance can take place. This is not the case with Argonaut-type reactors, and poses a substantial safety risk associated with continued operation of the facility, particularly in light of the reactor vendors--American Machine Foundry Co., now primarily in sporting goods, and American Standard Sanitary and Radiator Company--having had little reactor experience prior to designing the reactors and now having left the reactor business. Thus, the normal situation of an active vendor identifying problems

and formulating solutions is missing in the Argonaut case. (The existence of an entity holding the rights to the Argonaut design but not active in providing components or building more reactors does not mitigate this missing link).

6. CBG essentially alleges that a thorough analysis of past operating history of other Argonaut reactors to attempt to identify problems that may be common to the Argonaut-type is necessary. The assertion is correct from fundamental safety principles.

7. Most engineered devices are failure tested before being marketed. The basic rule is that such devices must be tested through many expected lifetimes of use of the device before marketing. And that also includes testing to failure. That is difficult to do in the case of reactors, although most reactor components nowadays (as opposed to those contained in the UCLA reactor) do undergo some failure testing. Because of the lack of such testing, it is essential that prompt notification of unexpected or unanalyzed features of the reactor type be passed on to operators of other similar reactors.

8. CBG gives several good examples of problems common to Argonaut type reactors that should have received prompt notification to other reactors that are similar. The examples merely form a basis for the need for a thorough review of Argonaut reactors to determine from operating history if there are elements of a safety review that should be expanded in considering the UCLA application. Furthermore, it is clear that a system for future reporting of observed problems should exist.

9. The Hawley, et al. report and the Cort report are wholly inadequate for such a purpose. They theoretically examine, and in a most superficial way, potential accident sequences. As my colleague Mr. Warf observes in his declaration, the Hawley report in particular appears to set up highly fanciful accident scenarios and then knock them down, leaving far more credible scenarios unexamined. The reports are based purely on a cursory reading of applications for relicensing, rather than detailed examination of actual operating history, which is essential.

10. Significant safety problems have developed at the UCLA Argonaut in the last 20 years. Significant safety problems have been observed at other Argonauts during the same period. These are unanalyzed in the Application and related analyses, and the Applicant and the Staff have no mechanisms set up to ensure identification and notification of such problems in the future. These are serious safety deficiencies.

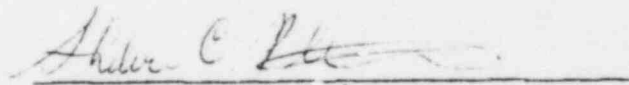
11. The problems reported with pressure fluctuations in the secondary coolant system at the University of Florida are not such as to preclude their occurrence at UCLA. UCLA's secondary system, like the U of F system, is tied into the normal city water system.

12. The positive temperature coefficient and the instabilities associated with coolant boiling indicate safety problems can arise because of insufficient core cooling.

13. The research and analysis done to date indicates a large number of very serious generic safety problems because of Argonaut reactor design and composition. These include Wigner energy storage, fire potential, power excursion potential, core crushing vulnerability, and explosive chemical reactions. During normal operation the production of Argon-41 is a generic problem not anticipated in the original analyses; it would have been attended to far sooner had the problems associated with Argon-41 release at other Argonaut reactors been called to the attention of UCLA and the NRC inspectors responsible for inspecting UCLA. 1975 was quite late to learn of the high levels which had existed for fifteen years.

14. It is concluded that the potentials for negative impacts upon the environment and the public are so large, given the site characteristics and other features, that a thorough examination of operating history and a far more competent review than has been done to date of potential accident sequences is necessary. In particular, the lack of a mechanism for identifying and notifying other Argonaut operators of problems identified is particularly of concern from a safety standpoint.

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 XV

RESPONSE TO NRC STAFF ASSERTED MATERIAL FACTS

1. DISPUTED (Kaku, E3, 83-86; Norton, E76; Aftergood on VIII whole declaration; Beyea, whole declaration)
2. LEGAL CONCLUSION
3. LEGAL CONCLUSION
4. LEGAL CONCLUSION
5. DISPUTE (Pulido, E3-17; Aftergood on VIII E7)
6. DISPUTE (Foster, entire declaration; Lyon, E17-18,20; Attachment A, April 11 Memo Reid to Bryan, NRC, attached to Foster declaration)