UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )
)
ARMED FORCES RADIOBIOLOGY )
RESEARCH INSTITUTE )
)
(TRIGA - Type Reactor) )

Docket No. 50-170
(Application to Renew Facility License
No. R-84)

## POSITION OF PETITIONER ON UNSTIPULATED CONTENTIONS

Pursuant to an agreement among the parties, signed on March 31, 1981, and forwarded by Staff Counsel to the Board, a stipulation on some contentions has been reached. The unstipulated contentions are contained in Attachment B. The Petitioners hereby submits its statement of position on those contentions not included in the stipulation.

### Unstipulated Contentions in Attachment A

1. Accidents I

1) This contention should be admitted because it raises a significant question concerning the public health and safety. In support of its admissibility, Petitioner cites the Board's recent ruling in The Regents of the University of California (UCLA Reactor), No. 50-142 OL, March 20, 1981, that in the context of "a small research reactor based in the heart of a large university campus" it was "compelled to consider possible hazard scenarios," including multiple failure modes (such as those described in this contention).

In the event of a rapid loss of coolant in the AFRRI reactor (e.g., more than 250 gallons of water per minute) in an actively operating core (i.e., in a recurrent pulsing mode), there could be a sudden temperature elevation (equal to or greater than 900° C) resulting in significant fuel element cladding failures. Such cladding failures have been demonstrated elsewhere on several occasions. (See

H. H. Hausner and J. F. Schumar in Nuclear Fuel Elements, p. 84). Even using Gulf General Atomic's experimental data for release estimates, the approximate 5% of the fuel inventory predicted to escape at temperatures at and above 900° C would exceed 10 C.F.R. Part 20 limits.

2) Insofar as this contention amounts to a challenge to the adequacy of NRC regulations (i.e., 10 C.F.R. Part 20, Appendix B concentration limits) by asserting that the health impacts of internal emissions should be considered, this case presents "special circumstances" warranting such a challenge pursuant to 10 C.F.R. §2.758. (See the accompanying Affidavit for the facts that support this challenge.)

2. Accidents II

1) Having since examined information not available to it at the time the Stipulations were signed, Petitioner withdraws this contention.

2) Petitioner calls the Board's attention to the ruling in the UCLA reactor case, cited above, in support of its position that contentions 2) a) and 2) b) are admissible. As in that case, the Board is compelled to consider the possible hazard scenarios for the multiple failure modes these two maximum credible accidents represent.

Petitioner cites the work of Professor Earl A. Gulbransen for its position that the chemical reactions between zirconium hydride and air and zirconium hydride and water are violently exothermic.

3. Testing Facility

The relevant criterion in 10 C.F.R. § 50.2 (r) designates as a testing facility one that is licensed to operate at a power level in excess of 10 Mwt. The issue here is whether the determining mode of operation for the AFRRI reactor is, or should be, its steady state mode or its pulsing mode. If it is the latter, the

the AFRRI power level exceeds 10 Mwt and the reactor falls within the definition of a testing reactor.

Petitioner alleges that the determining mode for the AFRRI license is its pulsing mode because this mode presents the greater radiological hazard. Petitioner cites in support of its position the case of Trustees of Columbia University (Docket No. 50-208, ALAB-3, May 26, 1970), where the Atomic Safety and Licensing Appeal Board (ALAB) was asked on a certified question from the Licensing Board whether the Columbia University TRIGA reactor was a testing facility within the meaning of 10 C.F.R. §50.2(r).

The ALAB concluded that the reactor's steady state mode presented the greater radiological hazard (i.e., higher fission product inventory) and was thus the determining mode (which, at 250 kw thermal, put the reactor below the 10 Mwt threshold for a testing facility).

In so deciding, ALAB relied heavily on the premise that the negative temperature coefficient would inherently limit the height and duration of the pulsing phase. Since all parties have stipulated that the "built-in" safety of the negative temperature coefficient in accident situations is at issue (Attachment A, Stip. Contentions, 2. Accidents II (2), last par.), the testing facility contention is also at issue and is thus admissible.

The case before this Board is also factually distinct from the Columbia case; e.g., the AFRRI reactor is approximately four times larger than the Columbia one and has a higher core reactivity, making its safety concerns more significant.

The Petitioner is prepared to brief this issue fully at the time of the hearing on the merits.

4. Siting

As a testing facility, the AFRRI facility is bound by the siting criteria set forth at 10 C.F.R. Part 100. (See Scope, §100.2 (a).)

To rule on siting, the Board need not even consider whether AFRRI is a testing facility, however. The Staff has used Part 100 for accident dose limits of research reactors, and neither the Staff nor Applicant offers any impelling logic to explain why Part 100 may be used for this purpose but not for siting criteria.

5. Routine Emissions I

1) As a result of an amendment to Part 20 of the NRC's regulations on March 25, 1981 (46 Fed. Reg. 18525, 10 C.F.R. §§20.105, 20.106, 20.405), nuclear power plants are bound by the EPA release levels set forth at 40 C.F.R. Part 190. The spirit of the amendment, i.e., to minimize the threat to the public health and safety of radiation, applies with equal force to power, testing, and research reactors.

2) Correction: The Inspection Report was from the year 1965, not 1975-1976 as the contention states.

Insofar as Applicant's current operating license permits incineration of solid radioactive waste, Petitioner asks the Board to condition the license renewal, if granted, on the prohibition of this practice in the future.

3) Neither Staff nor Applicant has provided sufficient information to conclude that, given the continuous day-in, day-out proximity to the reactor of many residents, hospital patients and staff, school children, the highest average annual exposure rate to these offsite areas has not resulted in, and continues to result in, doses to the public in excess of 0.5 rem /yr.

The Applicant's Environmental Impact Appraisal does not provide the reader with

enough information with which to determine whether the figures cited are actual release measurements or mathematical constants used to derive postulated releases.

4) Neither Staff nor Applicant has provided a firm basis from which to conclude that the emissions cited in Applicant's Environmental Release Report (ERR) came from a source not within the purview of License R-084. Control measurements were not taken after the Maxitron X-Ray facility was decommissioned, so it is not known if the Maxitron contributed to the releases in any significant amount. The cover letter to the ERR, from AFRRI's Director to the AEC Director of Reactor Licensing, states that environmental release data are herewith submitted for License R-084.

6. Security

This question should be admitted because it raises important questions concerning the public safety. Petitioner notes that the Licensing Board has recently admitted the security contention of the Petitioner in the UCLA reactor license renewal case, cited above.

The ease with which unauthorized persons can enter and exit the AFRRI facility, as shown by Applicant's history of security violations and and lax security and management procedures, demonstrates that the first barrier between the public and controlled access areas is extremely weak. Easy access into the AFRRI facility significantly increases the possibility that unauthorized, undetected persons can gain access to the controlled access areas.

Neither Staff nor Applicant has provided adequate information on the amount of special nuclear material Applicant possesses to conclude that security requirements for this facility are limited to those set forth at 10 C.F.R. §73.67.

## Conclusion

For the reasons set forth above, Petitioner asserts that the Unstipulated Contentions should be admitted.

Respectfully submitted,

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Dated at Washington, D.C. this
14th day of April, 1981.