November 7, 1990

Project No. 678

Marcia A. Thornton, Lt. Col., USAF
Terrestrial Nuclear Reactor Safety
Study Group Executive Officer
Department of the Air Force
Headquarters Air Force Inspection
and Safety Center
Norton Air Force Base, California 92409-7001

Dear Lt. Col. Thornton:

SUBJECT: COMMENTS ON THE STATIONARY NEUTRON RADIOGRAPHY SYSTEM (SNRS) SAFETY ANALYSIS REPORT (SAR)

We have reviewed the SNRS SAR Chapters 4, 7, and 13, as requested in your letter of October 4, 1990 and enclosed are some related comments for your consideration. Because your facility is not licensed by the Nuclear Regulatory Commission, these comments are not binding and no response is required.

If you have any questions concerning this review, please contact Mr. Marvin Mendonca of my staff at FTS 492-1128 or (301) 492-1128.

Sincerely,

Original signed by:

Seymour H. Weiss, Director
Non-Power Reactors, Decommissioning,
and Environmental Project Directorate
Division of Reactor Projects - III,
IV, V and Special Projects
Office of Nuclear Reactor Regulation

Enclosure:
As stated

DISTRIBUTION

√Docket File	NRC & Local PDRs	PDNP r/f	EHylton
AAdams	MMendonca	OGC	EJordan
SNewberry	ACRS (10)	WTravers	Region V

[SNRS SAR]

*See previous concurrences:

PDNP:LA*	PDNP:PM*	SICB*	PDNP:D*
EHylton	MMendonca:sr	SNewberry	SWeiss
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C 20555

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STATIONARY NEUTRON RADIOGRAPHY SYSTEM (SNRS)

Comments about Final Safety Analysis Report dated August 1990

The SNRS reactor is a 1 MWt TRIGA reactor, designed, provided, and started-up by General Atomics (GA). There are some differences between this TRIGA and most of the TRIGA reactors licensed by the Nuclear Regulatory Commission (NRC): notably the drive systems for the control/safety rods, and the control console system. The control console system is very similar to a GA version that has been reviewed by the NRC and is currently in use at a few NRC licensed non-power reactors.

The SNRS reactor facility is not licensed by NRC. Thus, this review of the FSAR did not make explicit comparisons with the NRC regulations applicable to non-power reactors. However, the review did attempt to judge whether the approach and content of the Final Safety Analysis Report (FSAR) left out any issues or topics that are expected to be included in comparable documents for NRC-licensed non-power reactor facilities.

The review showed that the general format and specific content of the SNRS FSAR are very similar to NRC-licensed FSARs. Also, the FSAR references additional facility documents, such as Emergency Planning, Operator Qualifications and Training, and Operating Procedures. These documents were not reviewed in the current effort.

Specific comments and questions follow:

1. Reactor Description, Chapter 4

   a. Reactor Design Bases

      (1) Most of the discussion of design bases and safety limits is similar to NRC-licensed TRIGA reactors; however, the document could be improved, if additional relevant references had been used and were cited, such as the TRIGA fuel article in Nuclear Technology 28, 31-56, (1976).

      (2) Page 4-2, Fuel Temperature, last sentence; should this sentence, in part, read "...with a H/Zr ratio between 1.50 and 1.70. ?" The correct range of applicable H/Zr ratio should be verified.

      (3) Page 4-3, Section 4.1.1, notation ascribed to reference 1; more recent information and discussions of hydrogen diffusion in other parts of the FSAR (page 4-6, e.g.) seem inconsistent with this statement.

      (4) Page 4-17, item "a." (mid page) and next to last paragraph; there is mention of "accident conditions," and "some hydrogen will escape---."

Additional description of accident conditions should be provided to establish a bases for the statements.

b. Mechanical Design

(1) Page 4-37, Section 4.2.3; there is a brief description of larger-sized holes that can be arranged within the core. Related safety analyses, under either normal or accident conditions, should be considered.

(2) Page 4-43, Section 4.2.7, Graphite Dummy Elements; if the graphite dummy elements are to be used anywhere in the core but at the periphery as implied in the FSAR, a safety analysis should be considered.

(3) Page 4-43, Section 4.2.8, Control System Design; the "non-traditional" rod-drive speeds, presumably due to the stepping motor drives, should be administratively controlled so that the operator assures withdrawal speed is appropriate.

(4) Page 4-44, Section 4.2.9.1; indicates that the central thimble has the capability to expel water with compressed air. The limited review of the SAR did not find any description of the related controls or analysis. Appropriate safety analysis should be considered for the potential impact of this activity or the effect of a potential loss of air from the central thimble.

c. Nuclear Design and Evaluation

Page 4-51, Section 4.3.2, 2nd paragraph; the comparison of 5.00$ pulses in a test TRIGA with a 3.00$ pulse in the SNRS should also discuss the significant differences in the two reactors, such as number of fuel elements, power distribution, neutron reflector, etc.

2. Instrumentation and Control, Chapter 7

Introduction, page 7-1, next to last paragraph; it would be helpful if the reference to NRC acceptance were made specific, so the reader of the FSAR could compare the two systems.

3. Conduct of Operations, Chapter 13

If the applicable ANSI/ANS-15 Standards were used in developing the various additional documentation for the facility, that should be pointed out at the appropriate places in the FSAR. If those standards were not used, they should have been, to help ensure that the SNRS facility will be managed and operated in a manner consistent with NRC-licensed facilities.