

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 50-170/78-04

Docket No. 50-170

License No. R-84 Priority 5 Category F

Licensee: Defense Nuclear Agency

Armed Forces Radiobiology Research Institute

Bethesda, Maryland 20014

Facility Name: Armed Forces Radiobiology Research Institute

Inspection at: Bethesda, Maryland

Inspection conducted: October 11-13, 1978

Inspectors: L. Briggs

L. Briggs, Reactor Inspector

11/3/78
date signed

R. Architzel

R. Architzel, Reactor Inspector

11/6/78
date signed

date signed

Approved by: E. C. McCabe, Jr.
E. C. McCabe, Jr., Chief, Reactor Projects
Section No. 2, RO&NS Branch

11/6/78
date signed

Inspection Summary:

Inspection on October 11-13, 1978 (Report No. 50-170/78-04)

Areas Inspected: Routine, unannounced inspection by regional based inspectors, of organization, logs and records; review and audits; requalification training; procedures; surveillance; experiments; and a tour of the facility including the witnessing of preparations for and conduct of reactor startup and pulsed operation. The inspection involved 30 inspector-hours onsite by two NRC inspectors.

Results: Of the seven areas inspected, no items of noncompliance were found in three areas; six apparent items of noncompliance (Deficiency - staff organization not as required by T.S. - Paragraph 2.b; Deficiency - failure to report misaligned fuel assemblies - Paragraph 2.d; Infraction - failure to perform safety evaluation - Paragraph 3.b; Deficiency - failure to document required requalification program readings - Paragraph 4.c; Infraction - procedures not maintained up to date and in effect - Paragraph 5.b; Infraction - Reactor room door seals not maintained as designed - Paragraph 5.c) were identified in four areas.

DETAILS

1. Persons Contacted

- *J. Arras, Head, Operational Health Physics
- *P. Durfee, Assistant, Operational Health Physics
- *M. Moore, CSO, in training
- *F. Owen, Head, Radiation Sources Division
- *R. Savage, P.I.C., in training
- R. Schaffer, Physicist in Charge
- *L. Slaback, Head, Safety Department
- *E. Still, Research Program Coordinator

Other licensee personnel, including operators and office personnel, were contacted.

* denotes those present at the exit interview.

2. Organization, Logs and Records

a. Organization

The inspector reviewed the Reactor Safeguards Panel organization and structure as revised by Amendment 16 to facility license R-84. Amendment 16 reorganized the committee structure to combine the Radiation Safety Review Committee and the Reactor Safeguards Panel into the Reactor and Radiation Safety Committee. The current membership of this committee is:

Colonel Darrell W. McIndoe, AFRI, Chairman
Mr. Bruce Cranford, AFRI
Maj Felix E. Owens, AFRI
CPT Ronald E. Schaffer, AFRI
LtCol Lawrence F. Winans, AFRI
Mr. Lester A. Slaback, AFRI
Mr. L. A. Brauch, NRL
Mr. Walter L. Geisler, HDL
Mr. T. G. Hobbs, NBS

Personnel presently assigned to the reactor branch are:

CPT Ronald E. Schaffer, PIC, SRO
SFC Willard R. Yuna, RO
HMI Lamar Creel, RO
Capt Robert Savage, trainee
Mr. Marcus L. Moore, trainee

b. Findings

The inspector compared the reactor branch personnel and their qualifications with Technical Specification (TS) requirements. It was noted that the staffing was not as required by TS section III, paragraph A in that the CSO is required to have a senior operator's license and did not have that license as of October 13, 1978. The licensee stated that a license was applied for on September 20, 1978 and that the Physicist in Charge (PIC) was functioning as both the PIC and the CSO.

It was noted that this situation had existed for about two weeks prior to the inspection and occurred when the previous CSO retired for medical reasons. The replacement CSO reportedly has several years of experience on a similar reactor where he was not required to hold an operator's license. Since the impending retirement of the previous CSO did provide lead time, it does not appear that the facility acted on this issue in time to either prevent this item of noncompliance with TS section III paragraph A (178/78-04-01) or obtain appropriate relief from or modification of the requirement.

c. Logs and Records

The inspector examined logs and records to verify that any significant problems were highlighted and that records were complete and concise.

The following documents were reviewed:

- Console Log Books, No. 50, April 14, 1978 through August 23, 1978 and No. 51, August 24, 1978 through October 12, 1978.
- Malfunction Log Book, 1977 through October 12, 1978.
- Daily Data Sheets, No. 2528, July 17, 1978 through 2568, October 11, 1978.
- Startup and Shutdown Checklists, No. 2547, September 5, 1978 through No. 2569, October 12, 1978.
- AFRI (R-084 YAE) Annual Report, October 1978.

d. Findings

The inspector noted during the review of the Annual Report that it was sent to the Director of Nuclear Reactor Regulation instead of to the Director of Region 1 as required by 10 CFR 50.59(b). Report submissions will be examined during subsequent inspections.

During the review of the Malfunction Log Book the inspector noted that on August 22, 1978 the licensee had discovered that two fuel assemblies were misplaced in the core. The two fuel assemblies, No. 3363, core location F-16, and No. 3332, core location F-15, were cocked because the lower locating pin was not inserted in the bottom core plate. This occurrence was not reported to the NRC. This is an item of noncompliance with section 4.(b) of Facility License R-84. (170/78-04-02)

3. Review and Audits

The activities associated with the licensee's review and audit functions were reviewed.

a. Reactor and Radiation Facility Safety Committee (RRFSC)

Minutes of the RRFSC meetings held on the following dates were reviewed: October 14, 1977; January 19, 1978; May 9, 16, and 23, 1978; and September 19, 1978.

The inspector noted that during this period meetings were required to be held by a Reactor Safeguards Panel (4 times a year) and by a Radiation Safety Review Committee (annually). The licensee formulated the Reactor and Radiation Facility Safety Committee and appointed members by a memorandum dated September 29, 1977. A license change to restructure the Reactor Safeguards Panel was requested on November 29, 1977 and approved July 25, 1978. The inspector noted that the licensee's external audit system (see paragraph c below) had identified this item and that it had been corrected by issuance of a Technical Specification change.

b. Facility Changes

During a tour of the facility and discussions with the licensee, the inspectors noted that a new control console had been installed. The console included updated power monitoring instrumentation and controls, and was installed in August 1978. The console included changes to the facility as described in the FSAR and the inspectors asked for the records of the safety evaluation performed to determine that this change did not constitute an unreviewed safety question. The licensee stated that such an evaluation had not been performed. Failure to perform the safety evaluation is an item of noncompliance with 10 CFR 50.59. (170/78-04-03)

c. Audits

The inspector reviewed the inspection results of the (Defense Nuclear Agency) "DNA - AFRRRI - TRIGA Reactor Facility Inspection" performed March 20-23, 1978, and the licensee's response dated May 24, 1978.

The inspector noted two items which had also been observed during the current (NRC) inspection. These included the composition of the Safety Committee (paragraph 3.a) and the requalification training records. The requalification training records were uncorrected as described in Detail 4.c of this report. The inspector had no other questions in this area.

4. Operator Requalification Program

The licensee's requalification training performed in 1977 and 1978 up to the last date of the inspection was reviewed. Results of the review were as follows:

- a. Two operators (one senior operator and one operator) participated in the program as required.
- b. The following records were verified to be maintained except as noted in paragraph c below.
 - Examinations, including individuals answers.
 - Documentation of required manipulations.
 - Record of completion of performance evaluation.
 - Maintenance of Checklist.
- c. Paragraph VI of the approved operator requalification program requires an annual review of the following documents and instructions.
 - (1) Reactor License (R-84)
 - (2) Technical Specifications
 - (3) 10 CFR-19, 20, 30, 50, 55 and 70
 - (4) AFRRRI Instructions
 - (5) Radiations Sources Division Instructions
 - (6) Safety Department Standard Operating Procedures

Paragraph III of the requalification program checklist documents completion of the annual required reading. Neither operator participating in the requalification program had documented completion of any required reading during 1977 or in the 1978 period prior to the last day of inspection (October 13, 1978). This is an item of noncompliance. (170/78-04-04)

5. Procedures

- a. A review of Instruction No. 5-1, Functions and Organization of the Reactor Branch, December 14, 1976, was performed to verify the following:
- Responsibilities of operators regarding adherence to procedures was clearly established in writing;
 - Methods of changing or deviating from procedure, both temporary and permanent, including approvals and levels of subsequent review, was clearly established; and,
 - The level of review and approval of new and changed procedures was clearly established.

No inadequacies were identified.

- b. The following operating procedures were reviewed to verify that they were technically adequate and met TS requirements.
- No. 5-2, Administrative Limits and Controls for Reactor Operations, 20 September, 1978.
 - No. 5-3, Reactor Branch Emergency Procedures, 14 December, 1978.
 - No. 5-4, Reactor Maintenance Program for the AFRRRI-TRIGA Reactor, 14 December, 1976.
 - No. 5-6, Reactor Operator Training and Requalification Program, 14 December, 1976.

The inspector began his review with procedures from the Physicist in Charge (PIC) file with a cross check of the control room operator's file. The following resulted.

- No. 5-2, PIC copy, pages 1, 3, 4, 5 and 6 dated 18 May, 1978 and page 2 dated 20 September, 1978. Control room copy, page 1, dated 18 May, 1978, page 2, dated 20 September, 1978, pages 3 through 6, dated 1 October, 1974.
- No. 5-3, PIC copy, dated 14 December, 1976. Control room copy dated 1 October, 1974.
- No. 5-4, PIC copy dated 14 December, 1976. Control room copy dated 1 October, 1974.
- No. 5-6, PIC copy dated 14 December, 1976. Control room copy dated 1 October, 1974.

All control room procedures were updated with the latest revisions prior to the inspectors departure on October 13, 1978.

The above examples represent noncompliance (Infraction) with TS section III paragraph c. (170/78-04-05)

- c. The inspectors verified that procedures were technically adequate to fulfill their intended functions by:
 - Performing a walkthrough of RSD instruction No. 5.2, Daily Startup Checklist for AFRRRI-TRIGA Reactor, performed prior to a reactor startup; and,
 - Observation of Health Physics Procedure 3-2, Calibration of Stack Gas Monitors.

No procedural inadequacies were observed; however, the inspectors did note that the doors to the reactor operating area and the reactor room had gasket material missing. The two doors in question, No. 3161 and 3105 are designed to restrict airflow when the reactor room ventilation positive sealing dampers are closed and are required by TS.

This is an item of noncompliance with TS section I.A.4. (170/78-04-06)

6. Surveillance

a. Technical Specifications Operating Limitations

The following Technical Specifications (TS) operating limits were reviewed to verify compliance:

<u>TS</u>	<u>Requirement</u>	<u>Setting</u>	<u>Results</u>
II.6	Reactor Water Level	18 inches below top of tank	Level verified by IO
II.1	Reactor power Level	1 MW Steady State	Power verified by IO of installed instrumentation and recorder charts. (RR)
II.4	Reactor Fuel Temperature	less than 600°C	IO verified 435°F at 1 MW Steady State.

(IO) - Verified by direct inspector observation.

(RR) - Verified by record review.

No items of noncompliance were identified.

b. Technical Specification Surveillances

The following procedures were reviewed to verify compliance with the T.S. surveillance requirements:

- No. D-9, Rod Drop Tests. Data reviewed for January 27, 1977, July 29, 1977, March 8, 1978 and August 28, 1978.
- No. B-6, Transient Rod Drive. Data reviewed for July 29, 1977, February 27, 1978 and October 12, 1978.
- No. D-6, Power Coefficients. Data reviewed for March 3, 1977, March 15, 1978 and September 13, 1978.
- No. C-10, Reactor Room Emergency Air System. Data reviewed for May 11, 1978, June 12, 1978, July 14, 1978, August 11, 1978, September 1, 1978 and October 12, 1978.
- Power Level Charts, December 21, 1977 through January 11, 1978.

No items of noncompliance were identified.

7. Experiments

A review of Reactor Use Requests for the past year indicated that no experiments were performed that did not have an approved routine

experiment procedure. There were no experiments performed in core or excore that would have any effects on reactor core reactivity. The review indicated that the reactor was used for three basic purposes: a) Training; b) Animal Experimental Irradiation; and, c) Radiation Effect Studies on Electronic Parts and Systems.

No unacceptable conditions were identified.

8. Facility Tour

The inspectors, accompanied by licensee representatives, toured the facility. Areas observed included housekeeping, fire hazards, radiation posting and reactor operations with T.S. limits (paragraph 6.a). The inspectors witnessed a reactor startup, power pulse and shutdown. Independent area radiation readings were taken by the inspectors in the control room and reactor area during operation. Appropriate procedures were adhered to during reactor operation and area radiation readings were consistent with postings.

No unacceptable conditions were identified.

9. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) on October 13, 1978 at the conclusion of the inspection. The inspector summarized the scope and findings at that time and in a subsequent phone call on October 24, 1978 when item 78-04-01 was further discussed.