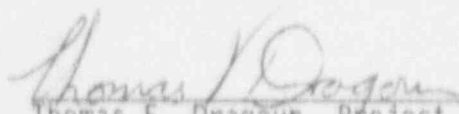


U. S. NUCLEAR REGULATORY COMMISSION
REGION I

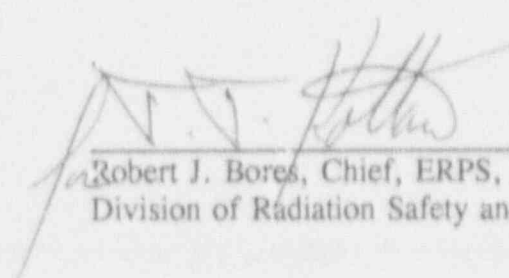
Report Nos. 50-170/92-01
Docket Nos. 50-170
License Nos. R-84
Licensee: Defense Nuclear Agency
Bethesda, Maryland 20814-5145
Facility Name: Armed Forces Radiobiology Research Institute (AFRR)
Inspection At: Bethesda, Maryland
Inspection Conducted: February 26-28, 1992

Inspector:


Thomas F. Dragoun, Project Scientist
Effluents Radiation Protection Section
(ERPS), Facilities Radiological Safety
and Safeguards Branch (FRS&SB)

3/23/92
date

Approved By:


Robert J. Bores, Chief, ERPS, FRS&SB
Division of Radiation Safety and Safeguards

3-26-92
date

Areas Inspected: Routine, announced inspection of radioanalytical laboratory upgrades, and operations. Areas reviewed included: organization and staffing, requalification program, surveillances, and audits and oversight.

Results: While the observed operational activities were conducted in a generally excellent manner, the licensee's system for surveillance records made comparisons to Technical Specification requirements difficult. Weaknesses in the radioanalysis laboratory were being addressed. No safety concerns or violations were identified.

DETAILS

1.0 Individuals Contacted

1.1 Licensee Personnel

M. Forsbacka, RSDR Executive Officer
*C. Galley, Head, Radiation Sources Department
*K. McCarty, Health Physicist
*M. Moore, Reactor Facility Director
*T. O'Brien, Division Manager, Op. H. P. Division
*C. Owens, RSDR Staff
*H. Spence, Senior Reactor Operator

1.2 NRC Personnel

*M. Mendonca, Sr. Project Manager

* Attended the Exit Interview on February 28, 1992. Additional personnel were contacted or interviewed.

2.0 Status of Previously Identified Items

2.1 (Closed) Unresolved Item (50-170/90-03-01): Determine the source of alpha contamination detected during routine surveys. The alpha activity has been attributed to spurious behavior of laboratory counting equipment caused by voltage fluctuations on the electric power supplies. "Conditioning" devices have been installed on the power supplies. No alpha activity has been reported since these devices were installed. This matter is resolved.

2.2 (Closed) Followup Item (50-170/90-03-02): Update personnel exposure records quarterly. The exposure files are now current. This matter is closed.

3.0 Radioanalytical Laboratory

During an inspection in April 1991, the NRC identified several weaknesses in the radioanalytical laboratory. Action on these items was determined from a tour of the laboratory, a review of records and procedures, and discussions with personnel. Status was noted as follows.

3.1 Laboratory Procedures

Changes were made to specific procedures based on comments made during the April 1991 inspection. The percent yield factors for the gross alpha and beta analysis of evaporated liquid samples have been deleted since the data didn't support their use. Rather than calibrating the iodine carrier solution for the chemical separation process,

iodine is now measured directly by gamma analysis, eliminating the need for a carrier. Waste water samples are now analyzed three ways: gamma spectral analysis, gross alpha and beta analyses after boil down, and by liquid scintillation analyses for tritium and carbon-14.

A complete rewrite of the entire set of laboratory procedures is planned to achieve a uniform format and provide explicit instructions for the laboratory technicians. The licensee stated that these new procedures will be issued by June 1992.

3.2 Instrumentation

Line voltage regulators/surge protectors have been installed on the electrical supply for each instrument to "condition" the line voltage as noted above in Section 2.1. This has eliminated erratic instrument behavior caused by voltage fluctuations and has resulted in consistent analytical results.

The software for the multichannel analyzer computer could not be corrected. An order has been placed for a new gamma spectrometry system and new computer to replace the existing system. The performance of the new equipment will be reviewed in future inspections.

3.3 Laboratory QA/QC Program

Inter-laboratory comparisons with the EPA laboratory are continuing. The Chi square test is now used to verify the operability of counting equipment. Environmental samples are now periodically spiked with technetium-99m to evaluate the accuracy and precision of analytical techniques. All radwaste samples with identified radioactivity are now split and then re-analyzed to verify the analysis. The use of control charts were initiated in January of this year for the counting equipment and provide a routine indication of instrument operability and performance trending.

3.4 Staffing

Both vacant technician positions and the one health physicist vacancy have been filled since the last inspection. However, the Department Manager left and the position was temporarily filled by the HP Division Manager in an acting capacity. The responsibilities of the Radiation Protection Officer and HP Division Manager have been separated so that different individuals may hold these positions. Creation of a new health physicist position has been proposed. Additional changes of responsibility are contemplated to strengthen the department but will not be implemented until a new Department Manager is appointed.

3.5 Conclusions

The inspector concluded that progress on upgrading the radioanalytical program was good and reflected good management oversight. Progress on the remaining items will be reviewed during future inspections. The licensee indicated that additional opportunities for staff training and development would be pursued.

4.0 Reactor Facility Organization and Staffing

The operating staff at the reactor facility consists of six licensed Senior Reactor Operators and one licensed Reactor Operator. The Reactor Operations Supervisor left during the year and was replaced by one of the military personnel. However, the replacement is due to be rotated out of the organization in May 1992. Currently, all senior experienced staff consist of military personnel who will eventually rotate. Although the staffing requirements of Technical Specification (TS) 6.1.3 were met, turnover of experienced personnel remains high.

The inspector observed the operation of the reactor in steady-state for the production of radioactive noble gas for diving experiments and single-pulse operation. Operations were conducted in an excellent manner by a staff who appeared to be well qualified. No safety concerns were noted.

5.0 Surveillances

The performance of surveillances required by TS 4.1, 4.2.1, and 4.2.2 was determined from a review of records, inspection of equipment, and interviews with personnel. Within the scope of this review, the inspector determined that the surveillances were completed. However, areas for improvement were noted as follows.

TS 4.1(c) requires the control rods be visually inspected for deterioration. There was no guidance provided to the operators as to the meaning of "deterioration" or observations to be recorded. The licensee stated that a procedure would be developed.

The inspector found it difficult to locate surveillance records since they were incorporated into computer controlled start-up tests, daily checks, and other checklists. The licensee stated that a cross-reference list would be developed identifying how each surveillance requirement was being satisfied.

Licensee action on these items will be reviewed in future inspections.

6.0 Audits

TS 6.2.5 requires an annual independent audit encompassing seven areas. The audit is conducted at AFRRRI by the Defense Nuclear Agency (DNA) Inspector General (IG). The inspector noted that the audit reports did not include an audit plan for the areas to be reviewed and closure of findings was satisfied by assigning responsibility to an individual. There was no verification of the adequacy of corrective action during a subsequent audit.

The Facility Director stated that AFRRRI personnel perform audits of other elements of DNA in accordance with an audit plan. The inspector reviewed this plan and found it to be excellent. The Facility Director stated that a similar plan would be developed for use by the IG during the annual in-house audit. This matter will be reviewed during a future inspection.

7.0 Reactor and Radiation Safety Committee

The inspector reviewed the composition and activities of the Reactor and Radiation Safety Committee for compliance with requirements in TS 6.2. A review of minutes of meeting of the committee and discussions with personnel indicated that the committee provided excellent oversight. Within the scope of this review, no deficiencies were observed.

8.0 Operator Requalification Training

One of the senior staff is responsible for coordinating the lectures, reactor console manipulations, medical evaluations, written exams, and records to ensure conformance with the NRC approved requalification program. The inspector reviewed selected records and found them to be satisfactory. However, the inspector noted that the matrix record maintained by the training coordinator for each operator did not list the specific reactor manipulations required to be performed during the requalification cycle. The licensee stated that this detail would be added to the records. This matter will be reviewed in a future inspection.

9.0 Exit Interview

The inspectors met with the licensee representatives indicated in Section 1.0 at the conclusion of the inspection on February 28, 1992. The purpose, scope and findings of the inspection were presented at that time.