

U. S. Nuclear Regulatory Commission
Region I

Report No. 50-170/90-03

Docket No. 50-170

License No. R-84

Licensee: Defense Nuclear Agency
Bethesda, Maryland 20814-5145

Facility Name: Armed Forces Radiobiology Research
Institute (AFRI)

Inspection At: Bethesda, Maryland

Inspection Conducted: November 28-30, 1990

Inspector:

for T. F. Kottan
Thomas F. Dragoun, Project Scientist
Effluents Radiation Protection
Section (ERPS)

12-26-90
date

Approved By:

for J. Roth
Robert Bores, Chief, ERPS,
Facilities Radiological Safety and
Safeguards Branch, Division of Radiation
Safety and Safeguards

12/26/90
date

Inspection Summary: Inspection on November 28-30, 1990 (Report
No. 50-170/90-03)

Areas Inspected: Routine, announced safety inspection of the following areas:
emergency response drill, general employee training, staffing, routine radiation
surveys, and radiation exposure records.

Results: No violations were identified. Licensee action is required to update
training (Section 4.0), evaluate alpha contamination (Section 6.0), and update
exposure records (Section 7.0).

DETAILS

1.0 Individuals Contacted

N. Manderfield, Assistant Director, AFRI
Q. Galley, Radiation Sources Director
M. Moore, Reactor Facility Director
C. Owens, Reactor Operations Training Coordinator
M. Forsbacka, Reactor Operations Supervisor
B. Wampler, Operational Health Physics Division
S. Wegner, Dosimetry Department
C. Pellosie, Safety and Health Department
T. O'Brien, Division Manager, Op. H.P. Division
S. Keller, Op. H.P. Division
D. Ashby, Manager, Safety and Health Department
S. Holmes, Senior Reactor Operator
H. Spence, Senior Reactor Operator

All of the above personnel attended the Exit Interview on November 30, 1990.

2.0 Status of Previously Identified Items

2.1 (Closed)Open Item(87-02-01) Improve initial training. The licensee made changes that incorporate the topics required by 10 CFR 19.12. This matter is closed.

3.0 Emergency Drill

On November 28 the licensee conducted a planned emergency response drill to test the capability of the alternate emergency management team. The drill simulated a contaminated-injured worker but did not involve offsite response. The primary management team acted as drill coordinators and observers. The inspector monitored activities in the reactor control room, which served as the command center, and at the accident scene. The inspector concluded that the drill accomplished its objectives.

Several weaknesses were noted including: incorrect initial response that was directed towards hazardous material control rather than a medical emergency; communications difficulties using portable radios; and lack of clear command and control. All were attributed to a lack of experience by certain players in their emergency roles. Several additional weaknesses were discussed by the licensee's observers during the debriefing following the drill. The Reactor Facility Director stated that several training sessions to correct these weaknesses will begin on December 12 and another drill will be held to verify the effectiveness of the training. The inspector had no further questions.

4.0 General Employee Training

General employee training and refresher training are required by 10 CFR 19 and 10 CFR 20. The inspector observed the videotape presentation and reference material provided as initial training and attended one of the annual refresher sessions. The information provided in the initial and refresher sessions was generally appropriate but some minor changes were discussed with the Manager of the Safety and Health Department. One change involved the presentations regarding the biological effects of radiation. The current training emphasizes the effects of high level acute exposures but does not present information in Regulatory Guide 8.29 or state of the art knowledge regarding the low level exposures usually received by the staff. The licensee stated that the training material is being revised and this change will be incorporated.

During the refresher training the inspector noted a statement that NRC regulations require that pregnant workers must inform the employer of their condition and a 0.5 rem exposure limit must be applied during the pregnancy. The inspector stated that the 0.5 rem exposure is only a guideline at present and that declaration of a pregnancy is the worker's option, as provided by Regulatory Guide 8.13. Under the new 10 CFR 20 to be effective in January 1993, the licensee will become obligated to limit exposures to 0.5 rem but only for declared pregnant workers. The declaration remains optional. The licensee made this correction to the training presentations.

During the refresher training, a comedy skit was staged with the facility Assistant Director playing a bumbling researcher in a mock radioactive material laboratory. The group was later asked to identify the intentional errors made regarding laboratory technique. The inspector noted that this training technique was extremely effective.

5.0 Organization and Staffing

The staffing of the Reactor Operations and Safety and Health Departments were reviewed. The qualifications of selected personnel were also reviewed. The departments were fully staffed with qualified personnel, except for the Reactor Operations Supervisor, who is acting in the position until the Technical Specification requirements are met.

Staff turnover is quite high in the Reactor Operations Department due to the rotational assignments of the military personnel and civilian operators who quit. The licensee is attempting to compensate for this by establishing a computer database that relates all documents, records, changes, and design bases for the facility. This represents a good effort.

The operator qualification program is being restructured to provide for production type training while ensuring the availability of the reactor

for irradiation of research specimens. The scheduling of requalification training is also to be improved to avoid conflicts with other activities. These matters will be reviewed in a future inspection.

6.0 Routine Radiation Surveys

The status of the program for routine radiation surveys was determined from interviews with the Manager of the Operational Health Physics Division, review of survey procedures, tours of the facility, and review of survey records. Within the scope of this review, the following strengths and weaknesses were observed. Survey results are recorded on floor plan maps. This is a good practice. The inspector noted that detectable alpha contamination was reported in several smear surveys. A recent survey in the vicinity of a floor drain in the sample preparation area reported a few thousand picoCuries of alpha contamination. The floor drain leads to a waste tank that is periodically discharged to the municipal sewer system after radiochemical analysis. No alpha was reported from the laboratory analysis. However, the very high concentration of suspended organic solids in the samples could mask the alpha by self-absorption.

The licensee stated that the "apparent alpha activity" is attributed to cross-talk in the counting equipment used to analyze the smears. However, the licensee could not provide test data substantiating this assumption. The inspector stated this matter is unresolved pending a thorough review by the licensee staff. (50-170/90-03-01)

In addition, the inspector noted that several health physics procedures and instructions required updating or clarification. The responsible division manager stated that revisions to the procedures are underway. This matter will be reviewed in future inspections.

7.0 Personnel Exposure Records

The licensee provided evidence that the vendor used to process the personnel dosimetry is NVLAP certified as required by 10 CFR 20.202. Dosimetry is issued by name to radiation workers and is processed quarterly, except for the reactor operations staff, which is processed monthly. A random sample of personnel records indicated that exposures were very low and well within NRC limits. The inspector noted that in the limited sampling of records there were no exposure data for 1990. Some records had a written entry "Audited May 1990".

The licensee stated that staffing changes had caused a delay in the records updating. The inspector stated that NRC regulations limit

personnel exposures on a quarterly basis and that the licensee needs to keep timely records to show compliance with these limits. The licensee stated that this would be corrected. This matter will be reviewed in a future inspection (50-170/90-03-02).

8.0 Exit Interview

The inspector met with the personnel denoted in section 1.0 at the conclusion of this inspection on November 30, 1990. The scope and findings were presented at that time.

OUTSTANDING ITEMS FILE SINGLE DOCKET ENTRY FORM

REPORT HOURS

- | | | | |
|-----------------|-------|--------------------------------------|-------|
| 1. Operations | _____ | 7. Outages | _____ |
| 2. Rad-Con | _____ | 8. Training | _____ |
| 3. Maintenance | _____ | 9. Licensing | _____ |
| 4. Surveillance | _____ | 10. QA | _____ |
| 5. Emerg. Prep. | _____ | 11. Other | _____ |
| 6. Sec/Safegrd. | _____ | 12. Fire Protection/
Housekeeping | _____ |

Docket No. 15 DF 11 17101

Originator T DRAGON

Reviewing Supervisor R BORE

Item Number	Type	SALP Area	Area	Action Due Date	Updt/Clsout Rpt/	Date O/M/Clsd
<u>1901-031-011</u>	<u>UMR</u>			- -	- -	- -
				MM DD YY		MM DD Y
<u>Originator/Modifier</u>		<u>Resp Sec</u>				
<u>DRAGON</u>		<u>11</u>				
<u>Descriptive Title</u>						
<u>INVESTIGATE ALPHIA COINITIAL MINATOM</u>						

Item Number	Type	SALP Area	Area	Action Due Date	Updt/Clsout Rpt/	Date O/M/Clsd
<u>1901-031-021</u>	<u>UMR</u>			- -	- -	- -
				MM DD YY		MM DD Y
<u>Originator/Modifier</u>		<u>Resp Sec</u>				
<u>DRAGON</u>		<u>11</u>				
<u>Descriptive Title</u>						
<u>UPDATE EXPOSURE RECORDS W/ ATIMELY MANNING</u>						

Item Number	Type	SALP Area	Area	Action Due Date	Updt/Clsout Rpt/	Date O/M/Clsd
- -				- -	- -	- -
				MM DD YY		MM DD Y
<u>Originator/Modifier</u>		<u>Resp Sec</u>				
		<u>11</u>				
<u>Descriptive Title</u>						