Region 1 Form 198-F
(October 1988)

IRRADIATORS

LICENSEE: Dept of Army - CECOM

REPORT NO. 90-01

ADDRESS: Ft. Monmouth, NJ

LICENSEE CONTACT: J. SANTARSIERO, RSO

Telephone No. (201) 532-9080

LICENSE NUMBER	DOCKET NUMBER	CATEGORY	PRIORITY	PROGRAM CODE
29-01022-06,07	3005248	E1A	2	3616
10,13,14	3006989	E	3	3511
SMM-1323	3009718	E3	1	3521
	3029741	K	7	3124
	7001351	F	5	22140

INSPECTION DATE(S) 9/18-19/90

INSPECTION LOCATION(S)

Ft. Monmouth, NJ

Evans Area, NJ

TYPE OF INSPECTION

/ / SPECIAL /X/ ROUTINE

/ / ANNOUNCED /X/ UNANNOUNCED

/X/ DAYSHIFT / / BACKSHIFT

SUMMARY OF FINDINGS AND ACTION

/X/ NO NONCOMPLIANCE, 591

/ / NO NONCOMPLIANCE LETTER

/ / NONCOMPLIANCE, 591

/ / NONCOMPLIANCE, LETTER

/ / ACTION ON PREVIOUS NONCOMPLIANCE, APPENDIX B

/ / SUPPLEMENTAL INFORMATION, APPENDIX C

PERSONS CONTACTED (Name, Title)

* M. Zarick, Alt. RSO
G Ziola, h.p.
* SSG H. Bianchi, h.p. tech.
W. Hulse, Act Chief CECOM Safety Office
Dr. Kronenberg, Physicist
* C Kenny, Branch Chief
J. Tomaini, electronics tech.

* attended exit meeting

Craig Z. Gordon 9/21/90

Inspector Signature, Date

Inspector Signature, Date

APPROVED [signature] 9/21/90

AA/86

1. ORGANIZATION (C) NC

a. Describe the management structure. C NC

CECOM Safety Office
- Radiol + Envt'l Engineering
  - Rad Eng.
  - Envtl Eng.
- Systems Engineering

b. Describe the radiation protection organization. (C) NC

Chief, Safety Office
|
Chief, Rad + Envt'l Eng.
|
RSO
|
Alt. RSO — h.p.'s

c. Individuals identified in the license as being responsible for the programs still hold these positions. (C) NC

Barry Siber - RSO on 1F licensi
Joseph Santsein - irradiators + R/D
> no changes

d. Audit and/or Management Control program conducted as required. (C) NC NA NI

1. records maintained (y)/n/na/ni
2. appropriate scope (y)/n/na/ni
3. deficiencies identified and corrected (y)/n/(na)/ni

Comments

7 staff members to carryout majority of program function's!

RSO

Alt RSO

3 h.p

1 h.p. tech

1 contractor (authorized full time)

RESULTS

2. Scope of Licensed Activities — (C) NC

a. Describe the types of current activities. — (C) NC

5 licenses
- 2 irradiator @ vaults inactive for 3-4 yrs
- 1 R+D - labs (2) pool routine
- 1 redistrib - devices sent worldwide for field missions
- 1 Pu battery - soon to expire

b. Describe the current workload in terms of the number of workers, number of shifts, or other appropriate information.

almost all day shift work; sometimes special projects at night but same group always uses it.

c. Describe any changes since the last inspection, and any which may be planned.

Comments

Expect to transport Pu battery to DOE by 10/31/90 + will let license terminate

No other major changes - will provide NRC w/ notification of shipment

2C. Co-60 Pickering irradiator shipped ~~as~~ waste to Barnwell. No use of other 2 vault irradiators due to upgrade of electronics + interlock system. Expected operation by end of 1990. Although licensee authorized use of irradiators for R+D activities, licensee personnel committed to maintaining storage-only configuration until electronics system completed.

RESULTS

3. TRAINING AND INSTRUCTIONS TO EMPLOYEES — (C) NC

a. Instruction to all persons working in a restricted area (19.12). — (C) NC NA NI

b. Additional required training for operators and other specified workers. — (C) NC NA NI

1. approved training program — y/n/(na)/ni
2. training provided by Rad Engineering Br
3. operators completed on-the-job training — y/n/na/ni
4. tests are given
   a. written tests — y/(n)/na/ni
   b. oral — (y)/n/na/ni
   c. practical — y/(n)/na/ni
   d. records of tests maintained — (y)/n/na/ni
   e. deficiencies noted and corrected — (y)/n/na/ni
5. training records reviewed by NRC inspector for period 3/87 to 12/89
6. qualified operator on site during all irradiator operations — (y)/n/na/ni

c. Periodic training is implemented as required. — (C) NC NA NI

1. records of retraining maintained — (y)/n/na/ni
2. Describe frequency and scope of periodic training: last - 12/89, 4/88, 3/87 — calendar year

Comments

3b6. 2 Qualified users for vaults + pool:

1. Dr. Kronenburg
2. Joe Tomaini

no one else permitted to use unless under their supervision

3b4 Annual training lecture given to all personnel on TLD's. Covers Army h.p. regulations

12/89 - list of attendees adequate
* 4/88 - " " " missing - records unsat.
3/87 - " " " adequate

· 88 missing records was an oversight Licensee seems conscientious re training. + developed new sign-in sheet

3b1. Approved training program is for RPO's who use field commodities. Not None for hp's or irradiator use.

RESULTS

4. MATERIALS, FACILITIES, AND EQUIPMENT — C NC

a. Materials inventory as authorized by license. C NC

1. type and quantity authorized (y)/n/na/ni
2. six-month inventory as required by license (y)/n/na/ni
3. inventory records reviewed for the period Aug/89 to 5/90
4. current inventory: _____ Curies as of _____(date)

Pool ~ 9000 Ci
vault - 2 sources ~ 500 Ci
balance in Ci range (total 122 sources)

b. Irradiator facility safety systems as required. C NC NA NI

1. posted as required by 20.203(c)(1) (yes)/no
2. interlocked as required by 20.203(c)(2)(i) (yes)/no
3. entrance controlled in accordance with 20.203(c)(2) (yes)/no
4. exit controlled in accordance with 20.203(c)(3) (yes)/no
5. entry control devices function as required by 20.203(c)(6) (yes)/no
6. visible and audible signals operate correctly to warn of the presence of radiation: 20.203(c)(6) yes/(no) but access restricted to RSO
7. level control for liquid shield: 20.203(c)(6)(iii) (yes)/no
8. source exposure procedure used (yes)/no
9. control devices tested at intervals required by 20.203(c)(6)(vii) (yes)/no
10. product carriers inspected as required: LC N/A yes/no
11. records of control devices tests maintained yes/no

c. Inspector observed proper operation of the following:

1. personnel door interlock pass/fail/not tested
2. product conveyor door interlock X pass/fail/not tested
3. maze radiation monitor X pass/fail/not tested
4. exit portal radiation monitor X pass/fail/not tested
5. visible and audible signals pass/fail/not tested
6. level control alarm for liquid shield X pass/fail/not tested
7. clearance of cell at startup X pass/fail/not tested
8. emergency shutdown switch in cell X pass/fail/not tested
9. ventilation system interlock X pass/fail/not tested

Other:

_____
_____
_____
_____

vault interlocks not tested due to system undergoing maintenance. Expect to be completed by end of year. Sources in storage only for 3-4 yr. Pool access is restricted.

d. Postings and labelings as required (C) NC NA NI

1. 20.203(b) radiation area (y)/n/na/ni
2. 20.203(e) use or storage areas with "Caution - Radioactive Material" (y)/n/na/ni
3. 20.203(f) containers and devices properly labeled (y)/n/na/ni
4. 19.11(a)(b) posting of documents (y)/n/na/ni
5. 19.11(c) posting of NRC-3 (y)/n/na/ni

RESULTS

5. INSTRUMENTS, EQUIPMENT, AND DEVICES — C NC

a. calibrated and operable meters available and used properly. — C NC NA NI

1. number, type, and ranges (e.g 2, ion chamber, 1 R/hr)

Number	Type	Range

high range Ludlum 5 0-2R/hr several available

2. 2 mR/hr through 1 R/hr can be measured — (y)/n/na/ni
3. calibrated by: calib in house — provided list of instrument inventories
4. calibration method as authorized — (y)/n/na/ni
5. calibration performed as required frequency: Q — y/n/na/ni

b. Water treatment systems function as required. — C NC NA NI

1. conductivity and pH tested and maintained within license limits. — (y)/n/na/ni
2. current water quality: conductivity <1 microsiemen/cm date: 9/14+9/18 pH _____ date: _____
3. ion-exchange resin ____ replaced ____ regenerated last date: 8/90 filters damaged

c. other special equipment (pool water monitors, ion-exchanage resins, ventilation systems, automatic fire extinguishing system, etc.) operable and available as described in license — C (NC) NA NI

Describe: committed to install fire detector or smoke detector inside pool area. One smoke detector in main area on ceiling too far from pool.

Comments

For 14 license: Inventory maintained via database of all field commodities (licensed devices used in field) by ser#, leak test date, + leak test results.

RESULTS

6. RECEIPT AND TRANSFER OF MATERIALS — (C) NC NA NI

a. Procedures for picking up, receiving, and opening of packages performed as required by 20.205. — (C) NC NA NI

1. written procedures available	y/n/(na)/ni	
2. procedures approved in application	y/n/(na)/ni	
3. survey of packages when received	(y)/n/na/ni	
4. 20.401 records of survey of packages	(y)/n/na/ni	inspected 89 + 90 shipment + receiving records
5. 20.401 records of receipt of packages	(y)/n/na/ni	

b. Source loading procedures performed. — C NC (NA) NI

1. date of last source load: _____		
2. radiation survey performed	y/n/na/ni	Sources never changed;
3. record of survey maintained	y/n/na/ni	Originals from early '80s
4. report of survey sent to NRC	y/n/na/ni	

c. Licensed material transferred as required. — (C) NC NA NI

1. 30.41 verification of recipient's license	(y)/n/na/ni	
2. 20.401, 30.51 records maintained	(y)/n/na/ni	
3. Licensee makes shipments of radioactive materials	(yes)/no	periodic shipments (5-10/yr) of small amts of material; all records maintained
a. delivered by common carrier	(yes)/no	
b. transported in licensee's own vehicle as a private carrier.	yes/(no)	

*IF ABOVE IS ANSWERED "YES", COMPLETE 6.A: TRANSPORTATION

Comments

RESULTS

6.A TRANSPORTATION		C	NC	NA	NI
1. Are authorized packages used	173.415-416		(yes)/no		
2. Types of packages used (for example, DOT-7A)	173.415		Special package design for commodities		
3. Performance test records on file	173.416(a)		yes/no		
4. Licensee aware of 6/30/85 cutoff on use ( ) certified	173.416(b)		yes/no		
5. NRC COC's on file	71.12(c)(1)		yes/no		
6. Registered with NRC as user	71.12(c)(3)		yes/no		
7. Documented NRC-approved Q/A program? NRC Q/A Approval number_____	71.12(b)		yes/no		
8. Special Form Material Performance test records available for each source design	173.476(a)		yes/no/na		
9. packages labeled as required	172.403 (a-f)		(yes)/no		
a. Excepted					
b. White I					
c. Yellow II					
d. Yellow III					
10. surveys performed to select correct label category and compliance with radiation limits	175.475(i)		(yes)/no		
11. Packages marked as required with	172.300-310		(yes)/no		
a. shipping name			(yes)/no		
b. Spec No.					
c. Certificate of Compliance Number (COC No.) etc.					
12. Shipping papers are prepared for each shipment	172.200		(yes)/no		
13. Shipping papers contain required information	172.203(d)		(yes)/no		
14. For private carrier shipments:					
a. vehicles placarded as required	172.500,504		yes/no		
b. cargo blocked, braced, tied down in vehicle	177.842(d)		yes/no	N/A all brokered	
c. any incidents reported to DOT	171.15-16		yes/no		
15. Licensee carries shipping papers that are readily accessible when transporting radioactive material					

Comments

RESULTS

7. PERSONNEL MONITORING — C NC NA NI

a. Personnel dosimetry assigned and worn. (C) NC NA NI

1. whole-body badge used (y)/n/na/ni
   a. until 12/89 film began Jan 90 TLD
   b. exchange frequency: mo
   c. supplier US Army Ionizing Dosimetry Ctr Lexington, Ky
   d. supplier NVLAP accredited 20.202 (y)/n/na/ni
2. workers observed wearing dosimetry (y)/n/na/ni

b. Personnel dosimetry reports maintained. C NC NA NI

1. records reviewed by management at a frequency of: M y/n/na/ni
2. NRC inspector reviewed personnel monitoring records from 1985 to present y/n/na/ni
   a. whole body quarterly dose: typical 10 max ____
   b. extremity quarterly dose: typical ____ max ____
3. NRC forms or equivalent records completed (y)/n/na/ni
   a. NRC-4 (y)/n/na/ni
   b. NRC-5 (y)/n/na/ni
4. Termination and annual reports to individuals and NRC, as required by 20.407 and 20.408 y/n/na/ni

Comments: final exposure records placed in medical records @ Lexington Bluegrass

- Request for change in exchange frequency from M → Q approved by NRC 4/90. Licensee will begin quarterly TLD program by end of year
- 7a,b. No exposures > 15 mRem ever reported (back to 85) even for technicians who perform instrument calibrations w/ Cs + Co irradiators
- Procedure to badge visitors needs review.

  Visitors w/ outside dosimetry are not given Army badges. Licensee will consider badging all visitors.

RESULTS

8. RADIATION SURVEYS AND LEAK TESTS — (C) NC NA NI

a. Facility and unrestricted area surveys conducted. — (C) NC NA NI

1. area or facility surveys recorded — (y)/n/na/ni
2. surveys performed as required — (y)/n/na/ni
   frequency: M
3. appropriate instruments used LUDLUM 5 — (y)/n/na/ni
4. NRC inspector reviewed survey records for the period Jan '89 to Aug '90
5. maximum radiation levels in unrestricted area: <.02 mR/hr
   max in unrestricted area up to 20 mR/hr @ contact w/ Cs-137 calib source

b. Leak tests of sealed sources performed — C NC NA NI

1. performed by user and method approved — (y)/n/na/ni
2. leak testing method used:
   water sampling — yes/(no)
   continuous monitoring of ionizers — (yes)/no
   periodic monitoring of ionizers — yes/no
   direct wiping of sources — (yes)/no
3. tested at six-month intervals 34.25(b) — (y)/n/na/ni
4. records maintained — (y)/n/na/ni
5. records reviewed by NRC inspector for the period 1/3/90 to 9/18/90

Comments

8b2. 10 ml aliquot taken from pool instead of 100 ml per licensee application commitment.

RESULTS

9. EFFLUENT CONTROL AND WASTE DISPOSAL — C NC (NA) NI

a. Releases with the environment in accordance with requirements. — C NC (NA) NI

1. liquid releases are made — y/n/na/ni
   to ____ sewer ____ unrestricted areas
   a. evaluations are adequate — y/n/na/ni
   b. releases are within limits: 20.106,20.303 — y/n/na/ni
   c. typical concentrations: _____
2. records maintained — y/n/na/ni
3. describe disposal of water from the regeneration of ion-exchange resins, if applicable:

b. Waste disposal in accordance with requirements. — (C) NC NA NI

1. Describe disposal of replaced resin, if applicable:

Treated as rad waste. Placed in drum & shipped to waste disposal facility

2. Describe any other methods of waste disposal:

OK except for Pickering source shipment (manifest misplaced) shipping papers provided 9/9; concern resolved.

3. Records of waste transfers maintained — y/n/na/ni

c. Burial of licensed material done in past. — Yes (No)

1. location of past burials: _____
2. types of materials buried: _____
3. describe the types of surveys performed, results, etc:

d. 10 CFR Part 61 requirements reviewed — y/n/na/ni

Comments

RESULTS

10. NOTIFICATIONS AND REPORTS — (C) NC NA NI

a. Licensee is in compliance with

1. reports of thefts or losses (20.402) — (y)/n/na/ni
2. reports of incidents (20.403) — (y)/n/na/ni

b. Licensee took appropriate action in response to the following Bulletins, Circulars, and Information Notices. — y/n/na/ni

1. _____
2. _____
3. _____

Comments

RESULTS

11. OTHER LICENSE CONDITIONS — (C) NC NA NI

List any other license conditions which were reviewed during the inspection, and describe the results.

a. C NC

b. C NC

c. C NC

Comments

Need corrected cy for irradiator vault license

1. to delete Pickering source

2. change location of Cs-137 irradiator to Bldg 401, Evan area.

RESULTS

12. INDEPENDENT AND CONFIRMATORY MEASUREMENTS (C) NC NA NI

a. Areas Surveyed	Results
pool irradiator + bldg 401	< .2 mR/hr
calibration room	
vault irradiators	
isotope storage area	

b. Survey Instruments Used

		a.	b.
1.	Type	Eberline E-120	
2.	NRC #	000899	
3.	last calibration date	6/4/90	

c. Pool Water Sample

NRC - measured concentration _____

Licensee - measured concentration _____
(attach NRC lab results to field notes)

Comments

vault irradiator RMS monitor to display rad levels inside vault w/ source exposed inop.

APPENDIX A - DOCUMENTATION OF NONCOMPLIANCE

Requirement	Basis for noncompliance
1. 10 CFR _____ Lic Cond _____	
2. 10 CFR _____ Lic Cond _____	
3. 10 CFR _____ Lic Cond _____	
4. 10 CFR _____ Lic Cond _____	
5. 10 CFR _____ Lic Cond _____	
6. 10 CFR _____ Lic Cond _____	

APPENDIX B - LICENSEE ACTION ON PREVIOUS INSPECTION FINDINGS N/A

Identification and summary of action taken — Status

Report No: _____ Severity Level _____

Describe previous violation:

Corrective Action taken: OPEN

CLOSED

Report No.: _____ Severity Level _____

Describe previous violation:

Corrective Action taken: OPEN

CLOSED

Report No: _____ Severity Level _____

Describe previous violation:

Corrective action taken: OPEN

CLOSED

APPENDIX B (continued)

Identification and summary of action taken	Status
Report No: _____ Severity Level _____	
Describe previous violation:	
Corrective action taken:	OPEN
	CLOSED
Report No: _____ Severity Level _____	
Describe previous violation:	
Corrective action taken:	OPEN
	CLOSED
Report No: _____ Severity Level _____	
Describe previous violation:	
Corrective action taken:	OPEN
	CLOSED

APPENDIX C - SUPPLEMENTARY INFORMATION

( ) Unusual occurrence, conditions, etc. ( ) Unresolved items

( ) Description of attachments to field notes (x) Inspector's comments

Items for followup during next inspection:

1. Ensure all interlocks, electronics, RMS monitors in vault are operable if licensee has changed irradiators from storage only to actual use.
2. Licensee to provide heat or smoke sensor inside pool irradiator area.
3. Check shipping papers for transport of Pu battery.
4. Review procedure for issuing TLD's to visitors.