

APPENDIX F

COMMERCIAL IRRADIATOR INSPECTION FIELD NOTES
REGION I

Inspection Report No. 91-001

License No. 29-01022-10

Licensee (name and address)

Docket No. 030-0971P

Department of the Army
US Army Communications Electronics Command
Fort Monmouth, New Jersey
07703-5000

Acting for
Joe Santarone

Licensee Contact Brett Armstrong
Steve Horak

Telephone No. (908) 544-7112

Last Amendment No. 19

Date of Amendment March 26, 1991

Priority : 1

Program Code: 7521

Date of Last Inspection September 19, 1990

Date of This Inspection September 30, 1991

Type of Inspection :
 Announced
 Routine
 Initial
 Unannounced
 Special
 Reinspection


Next Inspection Date 4/93 Normal Extended Reduced

Summary of Findings and Action:

- No violations, Clear 591 or regional letter issued
- Violations, 591 or Regional letter issued
- Previous Violations Action No Action

Inspector : 
(Signature)

Date 10/2/91

Approved : 
(Signature)

Date 10/24/91

DD/23

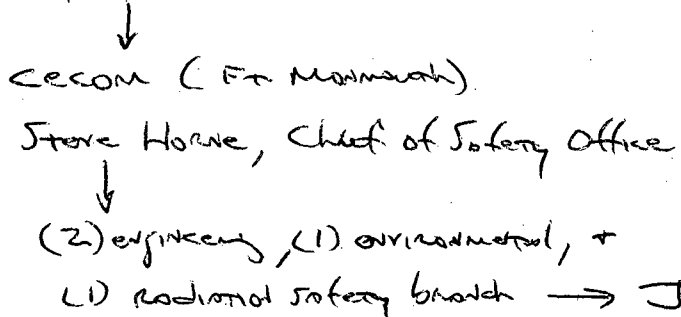
1. ORGANIZATION

a. Management Structure

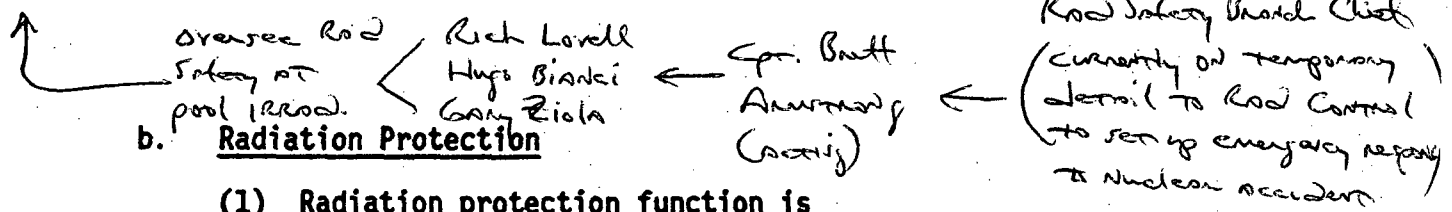
Army is moving towards develop a "Navy" like program - large broad scope with peer review.

- (1) Plant Manager involved in safety program? [L/C] Y () N
- (2) Plant Manager sets safety goals/objectives? [L/C] Y () N
- (3) Adequate budget and resources are provided to the safety program? Y () N
- (4) Corporate management supports safety through site visits, program reviews, and site support? [L/C] Y () N

Remarks: Army Materiel Command (Alexandria, VA)



Dr. Krasenberg + J. Tomani only was of irradiation.



b. Radiation Protection

- (1) Radiation protection function is separate from plant operations? [L/C] Y () N
- (2) A corporate policy exists which addresses radiation safety? [L/C] Y () N
- (3) A trained qualified RSO assigned? [L/C] Y () N
- (4) Radiation Protection procedures have been written and approved [L/C] Y () N

Remarks:

Licensor Also has a Radiation Control Committee of which Joe Santoro is Chairman + Steve Horne is the General representative - very active, meet frequently

c. Authorized Users

Authorized users are qualified through training? [L/C]

Y () N

Remarks:

2. LICENSEE INTERNAL AUDITS

a. Does the Radiation Safety Officer (RSO) conduct radiation safety audits? [L/C]

Y () N

Frequency varies - quarterly

b. Does corporate management conduct audits/reviews? [L/C]

Y () N

Frequency varies - annual

c. Does the licensee conduct annual ALARA reviews? [L/C]

Y () N

d. Are audit and review findings discussed in safety meetings? [L/C]

Y () N

Remarks: All safety functions performed by Safety officer, one member of office in radiation facility every day (estimate 60% of work effort). Army Medical Command audits entire program annually (includes HP)

3. INSPECTION HISTORY

a. Were violations, unresolved items or deviations identified in previous inspections?

Y () N

b. Were licensee corrective actions adequate on previous inspection findings?

Y () N

Remarks: January, '85 inspected medical warehouse with A&R no deviation - clean inspections 12/85, 10/87, 9/90.

4. TRAINING AND INSTRUCTIONS TO EMPLOYEES

a. Initial Radiation Worker/Operator Training

(1) A formal qualification/training program has been established and implemented. [L/C] Y () N

(2) Required tests administered, test scores satisfactory, and records retained. [L/C] *require approval, after review, by Radiation Control Committee*
NA () Y () N

(3) Training program is adequate for intended purpose and contains sufficient technical depth. [L/C] Y () N

(4) Management periodically reviews training program implementation. [L/C] Y () N

RPO has authority for interim approval

b. Retraining Program

(1) A formal program has been established to retrain radiation workers/operators. [L/C]

after approval, given Rad Safety Council when
() Y (X) N

(2) Retraining records are retained and reflect adequate program implementation. [L/C] Y () N

Not found, conducted as needed. A degree for need

c. General Training

(1) Instruction to workers provided [19.12] Y () N

(2) Instruction provided to ancillary personnel (security, custodial, maintenance, etc.) [L/C] *WBS* Y () N

Remarks: *Training provided to security & fire brigade
at entrance - instructed not to enter building
No other ancillary people with access to
restricted area.*

5. RADIATION PROTECTION PROCEDURES

- a. Have operating and emergency evacuating procedures been developed and implemented? [L/C] Y () N
- b. Are manufacturer's instructions for devices used and available? [L/C] () Y N (NA)
- c. Does the licensee maintain a logbook for recording operational data? [L/C] Y () N
- d. Is access controlled to high radiation areas? [20.203(c)]
 - (1) postings Y () N
 - (2) locks/barriers Y () N
 - (3) interlocks Y () N
- e. Are interlocks checked periodically for operability? [L/C] Y () N
- f. Are interlocks designed such that it is difficult to tamper or intentionally defeat them? [L/C] () Y N
- g. Are restricted areas established, posted, and properly controlled? [20.203] Y () N
- h. Are security measures in place to control or protect materials in storage? [20.207] Y () N
- i. Is entrance key attached to hand held survey meter? [L/C] () Y N

Sources are never removed from pool, interlocks placed at bottom of 20 ft pool - HRA > 10 ft deep.

Remarks: In-pool radiation - sources never exposed - located at the bottom of a 20 ft pool. Interlocks are (1) RMS II sensor located at vault door, over pool, and next to DI filter, set at 2mR/hr, checked monthly. Also have (2) float switches which alarm if water level drops ~ 1 ft, and ~ 2 ft. All alarms sound in irradiation building, security / fire instructed on who to call. Have a pipe set up to fill tank in the event of a catastrophic leak - fill can take place outside of building - started that water table so high that if catastrophic leak - water would flow into pool.

6. MATERIALS, FACILITIES, AND INSTRUMENTS

- a. Is the licensee in possession of the authorized type, quantity, and form of material? [L/C] ~ 9,000 curies Co 60 Y () N
- b. Are the materials being used as authorized? [L/C] Y () N
- c. Are appropriate survey meters on hand and operable? [L/C] Y () N
- d. Are survey meters calibrated at the required frequency? [L/C] by TMDE (Army) Y () N
- e. Are fixed process or area monitors operable and calibrated at the required frequency? [L/C] Y () N
(Test, Measurement or Diagnostic Equipment) → NIST traceable
- f. Is source shroud in place and in good repair? [L/C] () Y () N
Sources in pool, banners around pool
- g. Type of irradiator: () carrier () tote () pallet NA
- h. Manufacturer and model: Curtis Wright - Sources, pool
Design 127

i. Mode of operation: () continuous batch

Remarks: pool ~ 10ft in diameter, 127 pencils located in device at bottom of pool. Designed so that objects placed on center would receive uniform dose throughout. Currently



delivers 7.8 R/sec. Materials introduced usually suspended by "fish pole" located inside of a plastic product bucket for water hygiene

Irradiator last for one month demonstrated how does irradiation

7. SOURCE LOADING AND UNLOADING

London lot 60's, never measured

- a. Are procedures developed and implemented [L/C] *or otherwise manipulated* Y () N
- b. Are transfers of byproduct material proper? [30.41] NA () Y () N
- c. Are labels and packaging material appropriate? [71.5] NA () Y () N

d. Are records of receipt, transfer, storage survey, and monitoring maintained? [30.51]

NO () Y () N

e. Does licensee know the position (by serial number and activity) of all sources? [L/C]

() Y () N

Remarks:

ONE inch diameter x ~12" pencils, outer encapsulation aluminum, inner stainless steel, inner cobalt metal - entire pencil reactions
N₂ - Co Co.

8. PERSONNEL PROTECTION - EXTERNAL

a. Personnel monitoring control; minimize exposures, control of accumulated dose [20.101,102,104,202]

() Y () N

b. Dosimetry supplier: Army - Lexington Bluegrass (NVLAP)

c. Frequency of exchange: monthly

d. Type of dosimeters: film

e. Maximum exposures (W.B. and extremity):

minimum

f. Number of persons monitored: for monthly monitoring, 3 persons

g. Surveys conducted [20.201] monthly using () Y () N range .01 mR - 2R

h. Frequency, results, records [20.401] monthly
< 2x background at pool surface
yes

i. Levels in Unrestricted Areas [20.105] ~20 µR/hr

Remarks: This license authorized to go to quarterly frequency, has not done so because other Army Atomic licenses not yet approved for quarterly - waiting for complete authorization

9. LEAK TESTS/SOURCE INTEGRITY EVALUATIONS

CONTINUOUS MONITORING
of DI system,
RMSII SET AT
2 mR/hr, also
take 100 ml sample
2x/year +
ANALYZE INTENSIFIED
GEMMATION
Lambert JS +
NOTHING OVER
LED OVER

detected
(5×10^{-6} μ Ci)
last June
2/12/91 +
9/19/91

evaluate (2)
samples each
year

- a. Are leak tests and/or source integrity evaluations conducted? [L/C] Y () N
- (1) Are the tests conducted at regular intervals? [L/C] Y () N
- (2) Is the testing method sufficient to detect leakage or source integrity problem? [L/C] Y () N
- b. Is a water chemistry program established and procedures developed? [L/C] Y () N
- (1) Have chemical parameters and sampling frequency been identified? [L/C] Y () N
- (2) Have appropriate limits and action levels been established? [L/C] Y () N
- (3) Does the chemical sampling program include the following? [L/C]
- o total and suspended solids (conductivity) Y () N
 - o pH Y () N
 - o pool clarity Y () N
 - o chlorides/fluorides Y () N
- change at 10 μ Siemens
necessary ~ 2x/month
total more frequently, at interval per conductivity 0.9 μ Siemens
- c. Is the pool cleanup and cooling system operated as designed? Y () N
- d. Are demineralizers used for pool cleanup? [L/C] Y () N
- (1) Are demineralizers always in operation or are they used intermittently? [L/C] Y () N
- (2) Are radiation monitors placed on or adjacent to the demineralizer? [L/C] Y () N
- (3) Are alarm set points established for those monitors? [L/C] Y () N
- (4) Does the monitor alarm in the control room? [L/C] Y () N
- e. Are records maintained of leak tests and source integrity? [L/C] Y () N

DI + charcoal changed 2x/yr

Remarks:

10. RELEASE OF EFFLUENTS [20.106]

Does licensee evaluate:

- a. water leakage from pool? Y N
- b. effluent from regeneration of demineralizer? Y N *Not regenerated*
- c. pool sediment? Y N
- d. release of demineralizer to nonlicensed service company? *NA* Y N

Remarks: Low source strength (minimal heating of water) combined with no movement of source results in very low water loss. Licensee adds an inch of water ~ 2x/year to make up for evaporational. Demineralizer resin replaced, well resin evaluated (100 grams) of intrinsic germanium, no detectable activity, disposal of in regular waste. Intake for demineralizer at *a good sample* bottom of tank, gets

11. TRANSPORTATION (10 CFR 71.5(a) and 49 CFR 171-189)

- a. Licensee makes shipments of RAM Y N
- b. Shipments are:
 - delivered to common carriers
 - transported in licensee's own private vehicle
 - both
 - no shipments since last inspection

Remarks.

Inspection tank water sample, no detectable Co-60.

Complete only if shipments made since last inspection:

- c. Shipments
 - (1) Authorized packages used [173.415,416] Y N N/A
 - (2) Package type used _____
 - (3) For DOT-7A packages, performance test record on file [173.415(a)] Y N N/A
 - (4) For DOT-55 packages, use is approved by NRC [173.416(a)] Y N N/A

- | | |
|--|---|
| (5) Other Type B packages used are approved [173.416(a)] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (6) Licensee has COCs on file with NRC [71.12(c)(1)] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (7) Licensee has a QA program approved by NRC [71.12(b)] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (8) For special form sources, performance test record on file [173.476(a)] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (9) Packages properly labeled [172.403, 173.441] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (10) Packages properly marked [173.200] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (11) Proper shipping papers prepared and used [172.200-204] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (12) Shipping papers readily accessible during transport [177.817(e)] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (13) Vehicles placarded as necessary [172.500, 504] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (14) Cargo blocked and braced [177.842(d)] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A |
| (15) Any incidents reported to DOT [171.15-16] | <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> None |

Remarks:

12. NOTIFICATIONS AND REPORTS

- | | |
|---|--|
| a. To individuals [19.13] | <input checked="" type="checkbox"/> Y <input type="checkbox"/> N |
| b. Overexposures, excessive levels and concentrations, incidents [20.403,405] | <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> None |
| c. Personnel exposures and monitoring termination reports [20.407,408] | <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> None |
| d. Theft or loss of licensed material [20.402] | <input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> None |

Remarks:

Individuals associated with past incidents have been with group many years

13. POSTING OF NOTICES

- a. Parts 19 and 20, license and documents, procedures, and Notices of Violations [19.11] Y () N
- b. Form NRC-3 [19.11] Y () N

Remarks:

14. EMERGENCY PREPAREDNESS

- a. Has an emergency plan and general implementing procedures been developed? [L/C] Y () N
- b. Has the plan been coordinated with appropriate offsite support authorities? (e.g. local government, emergency medical, state health authorities) [L/C] *coordinated with fire department* Y () N
- c. Are notification procedures adequate and up to date? Y () N
- d. Are management, RSO, and ~~offsite~~ authorities listed on the notification procedure? [L/C] *no offsite* Y () N
- e. Are licensee employees trained in emergency response activities? [L/C] Y () N
- f. Are drills conducted? [L/C] *1987* Y () N
If "Yes," are the drills critiqued? Y () N
- g. Are offsite officials involved in drills and training? [L/C] *1987* Y () N

Remarks:

Licensee believes emergency would involve leaky source (detected by one of three rod alarms), ^{fire,} or loss of pool water (detected by one of two water level alarms). Security has cell number (at Super). Security + fire department instances not to enter

Fire not rod issue, source remain at bottom of pool, stove buildings - alarm

15. PRODUCT MONITORING

- a. Has the licensee established a program for periodically monitoring irradiated products for potential contamination? [L/C] () Y () N

If "Yes," does the program include:

- (1) direct radiation surveys? [L/C] () Y () N

- (2) removable contamination surveys? [L/C] () Y () N

- b. Have action limits been established for product contamination levels? [L/C] () Y () N

- c. Are the licensee's survey techniques and methods sensitive enough to detect the established contamination level? [L/C] () Y () N

Remarks:

batch process - when material removed from pool there is an RMSII detector on surface of the water next to where the material exits (set on 2mR/hr). Source pencil much bigger than material irradiated.

16. RECORDKEEPING FOR DECOMMISSIONING

- a. Records of information important to the safe and effective decommissioning of the facility maintained in an independent and identifiable location until license termination [30.35(g)] (✓) Y () N

- b. Records include all information outlined in [30.35(g)] (✓) Y () N

Remarks.

17. NRC CONFIRMATORY MEASUREMENTS [10 CFR 20.105,201]

() N/A

- a. Meter used: Bicoid
- b. Calib. Date: NOT INDICATED - NEW INSTRUMENT
- c. Serial No: 33472
- d. Describe measurements taken and results:

surrogate pool, decontamination → ~20 pCi/l

collected 500 ml sample for analysis in our lab

no detectable activity.

18. INDEPENDENT INSPECTION EFFORT

Scope of program: (Results)

19. CONTINUATION OF REPORT ITEMS - USE BACK OF PAGE IF NECESSARY

Licensee has NOT instituted quarterly advisory as approved on this license at last amendment. Writing of approval for -06 license so they can institute in whole program. Checked back rot office, -06 license amendments No. 77 was signed out 1/29/91 - licensee (at Ft. Monmouth) had never received.

Licensee also intended in two amendments to the -07 license, one to authorize licensee in possession of a particular source already approved and one to add a new source. Proceeded the first amendment as in house - second amendment not yet in house - licensee believes it is still in their headquarters, will try to shake down.

Received request and proceed with.

20. LIST OF VIOLATIONS

NA

21. PERFORMANCE EVALUATION FACTORS

Licensee (name & location) Department of the Army
Cecan
 Ft. Monmouth, NJ 03707

Inspector J. Dwyer
Inspection Date September 30, 1991

- a. Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight () Y () N
- b. RSO too busy with other assignments () Y () N
- c. Insufficient staffing () Y () N
- d. Radiation Safety Committee fails to meet or functions inadequately () Y () N () N/A
- e. Inadequate consulting services or inadequate audits () Y () N () N/A

Remarks (consider above assessment and/or other pertinent PEFs):

Very good program — recommend reduced frequency of inspection

Regional follow-up on above PEFs citations: