NOTE: All areas indicated in field notes are not required to be addressed during each inspection.

INDUSTRIAL RADIOGRAPHY INSPECTION FIELD NOTES
Region III

Inspection Report No.  91001  License No. 14-24479-01
Licensee (name and address)
MASON & HANGER-SILAS MASON COMPANY, INC.
Large Army Ammunition Plant MIDDLETON, IA 52656
Licensee Contact JOSEPH F. SHANNON
License No.  /74404 Docket No. 030-18662
Telephone No. 319-753-7808

Last Amendment No. 03 Date of Amendment JULY 5, 1990
Priority: C-1
Program Codes: (✓) 03310 - Fixed
( ) 03320 - Temporary

Date of Last Inspection MAY 8, 1990
Date of This Inspection AUGUST 6, 1991
Type of Inspection: ( ) Announced ( x) Unannounced
( ) Routine ( ) Special
( ) Initial ( ) Reinspection

Next Inspection Date 9/2/08 (x) Normal ( ) Reduced ( ) Extended

Summary of Findings and Action:
( ✓) No violations, CLEAR 591 or letter issued
( ) Violations, 591 or letter issued
( ) Action on Previous Violations

Inspector: D. R. DEBON (Signature) Date AUGUST 10, 1991

Approved: WILLIAM H. SCHULTZ (Signature) Date 8-13-91

Appendix D, 87100 D-1 Issue Date: 2/1/91
1. **ORGANIZATION**
   a. Briefly describe the organizational structure:

   - **JOE SHANNON** is RSO with
   - **NICHOLAS KIELAK** as Alternate RSO
   - Both report to **RICK LOGHORY- PLANT MGR**

   b. Organizational structure meets license requirements. [L/C]

   c. Radiographers and Assistants named in license ( ) Y ( ) N

   d. List radiography personnel:
      (Indicate if they are radiographers or assistants)

      - **CARL BEARD**
      - **DENNIS BROBSTON** - PERFORMED PERIODICALLY SINCE LAST INS.
      - **JOHN CAIN**
      - **PAULIE OSBORN**
      - **RAY SMITH**
      - **RICH JOHNSON** - PERFORMED PERIODICALLY SINCE LAST INS.
      - **PHIL CLEM**

2. **INSPECTION HISTORY**
   a. Last inspection conducted on **MAY 21, 1980**

   b. Violations or deviations were identified ( ) Y ( ) N

   c. Response letter or 591 dated **MAY 21, 1980**

   d. Violations from Previous Inspection

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Violation</th>
<th>Corrective Action Taken (Y/N)</th>
<th>Status</th>
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   e. Any previous violations not corrected ( ) Y ( ) N

   Explain.

   Issue Date: D-2 Appendix D, 87100
3. **SCOPE OF PROGRAM**

a. License has multiple authorized locations of use ( ) Y ( ) N

b. If so, list location(s) inspected ( ) N/A

- They have two locations, but one is not being used at present

c. List those individuals contacted during inspection

- Nicholas Kiefer
- Rick Logan - P&L MGR
- Capt. Robert Rieves - Army Safety Office

*Indicates presence at exit meeting

d. Briefly describe scope, including types of equipment, types of use involving byproduct material, frequency of use, staff size, etc.

This program is a fixed facility ( ) Y ( ) N

- Bldg 310
- A 527 Ci Co-60 source and a 406 Ci Co-60 source.
- Radiographs are taken of heavy munition shells placed in
  holders that are moved by conveyor belts that are
  operating continuously through the radiation chamber.
- The 180 Curie are used. They are operated by the
  radiographer personnel mostly day shift. The unit is
  used shielded areas.

4. **OPERATING AND EMERGENCY PROCEDURES**

a. Licensee maintains current procedures ( ) Y ( ) N

b. Procedures contain all information specified in [34.32] ( ) Y ( ) N

c. Procedures are approved by NRC [34.11] ( ) Y ( ) N

Remarks. Most are part of backup to the license.
5. **TRAINING, RETRAINING, AND INSTRUCTIONS TO WORKERS**

a. Instructions to workers per [10 CFR 19.12] (Y N)

b. Parts 19, 20, and 34; the license; and Operating and Emergency Procedures furnished to all radiographers and assistants

[34.31(a)(2),(b)(1)] (Y N)

Remarks.

c. Training program required [L/C, 34.31] (Y N)

(1) If so, briefly describe training program: The personnel in the treatment procedure must attend annual course.

(2) Training program implemented (Y N)

(3) Written tests completed by all radiographers and assistants [34.31(a)(4), (b)(3)] (Y N)

(4) Oral tests [34.31(b)(3)] (Y N)

(5) Inspector reviewed test results (Y N)

(6) All radiographers completed on-the-job training (Y N)

(7) Retraining program required (Y N)

(8) Retraining program implemented (Y N)

(9) Records maintained [34.31(c)] (Y N)

Remarks. Annual RETRAINING EACH JANUARY 96 to 97 % on test after the training. Personnel have a test after each training session.

6. **INTERNAL AUDITS OR INSPECTIONS**

a. Audits or inspections of each radiographer and assistant are conducted per [34.11(d)] (Y N)

b. Equipment check prior to use each day [34.28(a)] (Y N)

c. Equipment inspection and maintenance performed at 3-month intervals per procedures [34.28(b)] (Y N)

Issue Date: Appendix D, 87100
7. FACILITIES

a. Permanent radiographic installation [34.2] ( ) N/A

(1) High Radiation Area entrances and exits controlled in accordance with [20.203(c)] ( ) Y ( ) N
(2) Entrance controls are of type described in [34.29(a)] ( ) Y ( ) N

If YES, complete (a)-(e) below: [34.29(b)] ( ) N/A

(a) Visible and audible signals warn of radiation ( ) Y ( ) N
(b) Visible signal actuates when source is exposed ( ) Y ( ) N
(c) Audible signal actuates if entry is attempted when source is exposed ( ) Y ( ) N
(d) System tested at 3-month intervals ( ) Y ( ) N
(e) Records maintained ( ) Y ( ) N

Remarks. Both units of 3 month intervals

b. Temporary High Radiation Area entry controlled in accordance with [20.203(c)(4) and 34.41] ( ) Y ( ) N ( ) N/A

c. Field location

(1) Field work authorized [L/C] ( ) Y ( ) N ( ) N/A
(2) Field inspection conducted ( ) Y ( ) N ( ) N/A

Appendix D, 87100 D-5 Issue Date:
NOTE: If inspector performs field inspection, a separate radiography field audit report should be completed and attached to these field notes.

d. Storage Area

(1) Storage facilities as described in license [L/C] (__) Y ( ) N
(2) Sources locked in devices [34.22] (__) Y ( ) N
(3) Devices secured to prevent tampering or unauthorized removal [34.23] (__) Y ( ) N

Remarks.

8. MATERIALS AND EQUIPMENT

a. Describe any special equipment used by licensee:
(shields, collimators, etc.) SPECIAL COLLIMATORS ON EACH UNIT

b. Radiographic exposure devices and storage containers meet radiation level limits per [34.21] (new rule eff. 01/10/90) (__) Y ( ) N

c. During radiographic operations, sources are locked in shielded position each time source is returned to that position. [34.22(a)] (__) Y ( ) N

d. All sealed sources not fastened to or contained in a radiographic exposure device are tagged per [34.25(e)] (__) Y ( ) N

Remarks. The door will not open unless the source is exposed. They have a fail safe type unit that returns the source if air pressure is lost daily before any exposure.
e. Leak tests

(1) Leak test method approved [34.25(c)] (Y) Y (N)

(2) Model of leak test kit

(3) Leak tests performed at intervals not to exceed six months [34.25(b)] (Y) Y (N)

(4) Records maintained [34.25(c)] (Y) Y (N)

f. Inventory

(1) Quarterly physical inventories conducted [34.26] (Y) Y (N)

(2) Inventories contain all required information [34.26] (Y) Y (N)

(3) Materials possessed as authorized by license [L/C] (Y) Y (N)

(4) Procurement and use in accordance with license [L/C] (Y) Y (N)

(5) Most recent BPM inventory conducted on July 27, 1981

Source Changer Model # Activity Isotope Source S/N Camera Model and S/N

Remarks:

g. Utilization logs

(1) Utilization logs maintained [34.27] (Y) Y (N)

(2) Logs contain all required information [34.27] (Y) Y (N)

Remarks: The licensee reported a loss of log information for 3 mo. period to Oct. 22, 1990. These records were of work performed at 3A-168 AGR. These records were reviewed by NRC inspectors up to May 22, 1990. The unit has not been used since for leak test work.

Appendix D, 87100 D-7 Issue Date: [Redacted]
The quarterly inspection records are up to date and indicate that the unit had not been used since last inspection.

The license will be letting out of the two units soon. They will be reloaded with an accelerator.
9. INSTRUMENTATION

a. Describe the type and number of survey instruments possessed by the licensee:
   
   ![Instrument Types](image)

b. Instruments are capable of measuring 2 mR/hr through 1 R/hr [34.24] (Y Y Y N)

c. Operable and calibrated survey instruments available and used on each job [34.43(a)] (Y Y Y N)

d. Calibration performed at intervals not to exceed three months [34.24] (Y Y Y N)

e. Records maintained [34.24] (Y Y Y N)

Remarks. CALIBRATION PERFORMED BY MR. VOGT

10. RADIATION SURVEYS

a. Area or facility surveys conducted to show compliance with 20.105 [20.201(b)] (Y Y Y N)

b. Records maintained [20.401(b)] (Y Y Y N)

c. Survey after each exposure, including guide (the guide tube) and entire circumference of device [34.43(b)] (Y Y Y N)

d. Survey of device when placed in storage, including entire circumference of device [34.43(c)] (Y Y Y N)

e. Records maintained of final survey made when devices are stored for day [34.43(d)] (Y Y Y N)

Remarks.

WE SHIELDED AND CALIBRATED SHIELD. THE SOURCE DOES NOT LEAVE THE SHIELD.

Issue Date: D-8 Appendix D, 87100
11. PERSONNEL RADIATION PROTECTION - EXTERNAL

a. Film or TLD supplier \text{LAMDA[--]EK}\quad \text{Frequency Monthly}

b. Supplier is NVLAP - approved \(\checkmark\) Y ( ) N

c. Reports reviewed by \text{R10}\quad \text{Frequency As Receiving}

d. License exposure limit: \(\text{X} 1.25\ \text{rem/qtr} \quad ( ) 3\ \text{rem/qtr}.

e. NRC inspector reviewed personnel monitoring records for period \text{APR'91} \text{ to} \text{JULY 8, 1991}

f. NRC forms or equivalent

(1) NRC-4: \(\checkmark\) Y ( ) N \quad \text{Complete:} \(\checkmark\) Y ( ) N ( ) N/A

NOTE: NRC-4 must be completed PRIOR to individual receiving more than 1.25 rem per calendar quarter.

(2) NRC-5: \(\checkmark\) Y ( ) N \quad \text{Complete:} \(\checkmark\) Y ( ) N ( ) N/A

[20.401(a)]

g. List maximum exposures (millirem):

\text{The 1991 exposure appears to be 20 MREM MREM TOTAL}

The total annual exposures due to a problem at LAMDA.--EK were 10-20 MREM. For future periods, the license is trim.

\text{h. Each individual is assigned a pocket dosimeter, an alarm ratemeter (eff. 1/10/91), and a film badge/TLD [34.33(a)]}

\text{Remarks. VICTORI[A[--]N 54] LANDSVIK L-50}

\text{i. Pocket dosimeters}

(1) Type \text{VICTORI[A[--]N 54] - LANDSVIK L-50}

(2) Range \quad 0 - 200 MRE

(3) Recharged at start of each shift \[34.33(a)] \(\checkmark\) Y ( ) N

(4) Daily readings recorded \[34.33(b)] \text{weekly 10-20 MREM total for 3 yrs} \(\checkmark\) Y ( ) N

(5) Dosimeters checked for response \(\pm 30\%\) \text{at intervals not to exceed one year} \[34.33(c)] \text{ usually done at 6 months} \(\checkmark\) Y ( ) N

Appendix D, 87100 D-9 Issue Date:
j. Alarm ratemeters (eff. 01/10/91)

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<tr>
<td>(1) Type</td>
<td>F. E 3M, D-4</td>
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<tr>
<td>(2) Range</td>
<td>30 mR/HR</td>
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<tr>
<td>(3) Alarm checked at start of each shift</td>
<td>N</td>
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<tr>
<td>(4) Alarm preset at 500 mR/hr</td>
<td>Y</td>
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<tr>
<td>(5) Alarm ratemeters calibrated (+20%) at intervals not to exceed one year</td>
<td>Y</td>
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Remarks.

The licensee is not required to have alarms, but does raise them on an odd basis.

The pocket dosimeter readings back from Oct., 1980 were lost during a "clean up" of Bldg. 7A100. The records were reviewed by NRC Inspector to May 1980, the unit has not been used since then.

12. NOTIFICATION AND REPORTS

a. Licensee in compliance with [19.13] (reports to individuals) | Y N N/A
b. Licensee in compliance with [20.402] (theft or loss) | Y None

c. Licensee in compliance with [20.403] AND [34.30 - eff. 01/10/91] (incidents) | Y None

d. Licensee in compliance with [20.405] AND [34.30 - eff. 01/10/91] (overexposures) | Y None

e. Annual reports furnished to NRC per [20.407] | Y N

Remarks.

Issue Date: D-10 Appendix D, 87100
13. POSTING AND LABELING

a. Radiation Areas properly posted [20.203(b)] (Y N)
b. High Radiation Areas properly posted [20.203(c)(1)] (Y N)
c. Use or storage areas posted "Caution - Radioactive Materials" [20.203(e)(1)] (Y N)
d. Containers or devices properly labeled [20.203(f)] (Y N)
e. NRC-3 "Notice to Workers" is posted [19.11] (Y N)
f. Parts 19 and 20 and license are posted or a notice indicating where documents can be examined is posted [19.11] (Y N)

Remarks.

14. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIAL

a. Procedures established and followed for receiving, and opening packages [20.205(d)] (Y N)

b. Incoming packages wiped per [20.205(b)] 1987 (Y N)

c. Incoming packages surveyed per [20.205(c)] (Y N)

d. Shipment of sources since last inspection (N/A)

(1) Used container authorized by license [L/C] (Y N)
(2) Shipping papers and package labeling properly completed [71.5] (Y N)
(3) Transfer(s) performed per [30.41] (Y N)

e. Records of surveys and receipt/transfer maintained per [20.401(b) and 30.51] (Y N)

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

a. Licensee makes shipments of RAM
   ( ) Y (N) N

b. Shipments are:
   ( ) delivered to common carriers
   ( ) transported in licensee's own private vehicle
   ( ) both
   ( ) no shipments since last inspection

Remarks.

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)]
       ( ) Y ( ) N ( ) N/A

   (6) Licensee has COCs on file with NRC [71.12(c)(1)]
       ( ) Y ( ) N ( ) N/A

   (7) Licensee has a QA program approved by NRC [71.12(b)]
       ( ) Y ( ) N ( ) N/A

   (8) For special form sources, performance test record on file [173.476(a)]
       ( ) Y ( ) N ( ) N/A

   (9) Packages properly labeled [172.403, 173.441]
       ( ) Y ( ) N ( ) N/A

   (10) Packages properly marked [173.200]
        ( ) Y ( ) N ( ) N/A

   (11) Proper shipping papers prepared and used [172.200-204]
        ( ) Y ( ) N ( ) N/A

   (12) Shipping papers readily accessible during transport [177.817(e)]
        ( ) Y ( ) N ( ) N/A

   (13) Vehicles placarded as necessary [172.500, 504]
        ( ) Y ( ) N ( ) N/A

   (14) Cargo blocked and braced [177.842(d)]
        ( ) Y ( ) N ( ) N/A

Issue Date: D-12 Appendix D, 87100
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. Except for back tests and surveys.

17. BULLETINS AND INFORMATION NOTICES

(a) Bulletins, Information Notices, etc., received by the licensee ( ) Y ( ) N

(b) Licensee took appropriate action in response to Bulletins, INs, etc. ( ) Y ( ) N

18. **INDEPENDENT MEASUREMENTS**

a. Survey instrument used ____________

b. NRC Serial No. ____________

c. Last date of calibration ____________

d. Inspector's measurements were compared to licensee's

( ) Y ( ) N

e. Describe the type and results of measurements:

Both instruments in close agreement. Minimum of 90 mSv/hr on roof. Console area with source exposed. Average 0.2 mSv/hr. No 1 mSv/hr area contact with shield mix.

19. **CONTINUATION OF REPORT ITEMS - USE BACK OF PAGE IF NECESSARY**
20. LIST OF VIOLATIONS
21. PERFORMANCE EVALUATION FACTORS

Licensee: Mason, Hanger, Sills
(name & location: Mason-Hanger-Sills, Inc., Minnepolis, Minn.)

Inspector: D. K. C. Brooks
Inspection Date: August 6, 1981

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):

Regional follow-up on above PEFs citations:

Issue Date: D-16

Appendix D, 87100