



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30323

Report No.: 45-24967-01/90-02

Licensee: Tri-State Associates, Inc.  
P. O. Box 1579  
Woodbridge, Virginia 22193

Docket No.: 030-30391

Category: C1

Priority: 1

License No. 45-24967-01

Program Code: 3320

Inspection at: Woodbridge, Virginia and Washington, D. C.

Inspection Conducted: July 31 and August 1, 1990

Inspector: David J. Collins, Radiation Specialist

8/21/90  
Date Signed

Approved by: Edward J. McAlpine, Chief  
Radiation Safety Projects Section  
Nuclear Materials Safety and Safeguards Branch

8/21/90  
Date Signed

SUMMARY

Scope:

This unannounced routine safety inspection was conducted in the areas of personnel radiation protection; notifications and reports to NRC and individuals; transportation of licensed materials; radiation training; training of radiography personnel; internal audits; inspection and maintenance of equipment; field locations; and survey meters.

Results:

Six apparent violations were identified: Overexposure of an individual in a calendar quarter (Paragraph 2.a.); failure to perform a radiation survey adequate to evaluate the hazard presented by a lost film badge (Paragraph 2.b.); failure to report an overexposure to NRC and an individual (Paragraph 2.c.); failure to submit required annual reports (Paragraph 2.d.); failure to register with NRC for use of shipping packages (Paragraph 3); failure to post a high radiation area (Paragraph 4).

## REPORT DETAILS

### 1. Persons Contacted

Tri-State Associates, Inc.

- \*J. Dunn, President
- R. Dunn, Radiation Safety Officer

The inspector was accompanied by Mr. E. J. McAlpine, Chief, Radiation Safety Projects Section, Nuclear Materials Safety and Safeguards Branch, DRSS.

- \* Attended the exit interview on August 1, 1990

### 2. Personnel Radiation Protection

The inspector reviewed personnel dosimetry results from January 1989 through June 1990, calibration and maintenance records for radiation survey meters, alarming dosimeters and self-reading dosimeters. The inspector also reviewed the documents required to be provided to individuals and those required to be filed with NRC as a result of overexposures and annually by radiography licensees.

The licensee uses a properly certified dosimetry processor, and exchanges whole body film badges once per month. The inspector noted that there were frequent report submissions which listed films as being returned late and without control films. This practice could result in an inappropriate dosimetry exposure being recorded for an individual as a result of film aging or transportation exposure. The inspector discussed with licensee representatives increased effort to ensure the timely return of all dosimetry films at the same time. The inspector noted also that control dosimeter film corrections were made to the film badge readings for the wearing periods of January, February and March 1989.

Four apparent violations were identified:

- a. One individual's exposure record for the first calendar quarter of 1990 consisted of 3,620 mrem (January 25 - February 24 150 mrem; February 25 - March 24 3,440 mrem; March 25 - April 24 30 mrem). The licensee maintains an NRC Form 4 occupational radiation exposure history for each employee, receives and reports exposures on an NRC Form 5 equivalent, and has calculated the permissible lifetime exposure remaining for the individuals. The permissible limit of 10 CFR 20.101 is 3,000 mrem per calendar quarter, providing the above conditions have been met.

Permitting an individual exposure for the first calendar quarter for 1990 (January 25 - April 24, 1990) to exceed 3,000 mrem is an apparent violation of 10 CFR 20.101(b).

- b. A second individual's exposure record for the first calendar quarter of 1990 totalled 2,992 mrem (January 25- February 24 40 mrem; February 25 - March 24 2840 mrem; March 25 - April 18 92 mrem (dosimeter readings) and April 19 - April 24 20 mrem). As above, a completed NRC Form 4 is available, results are maintained on an NRC Form 5 equivalent, and the permissible lifetime accumulated dose was not exceeded. The individual reported his film badge lost on April 18, 1990, and executed a lost badge report. The licensee did not account for any exposure for the period March 25 - April 24 until requested to do so by the inspector. Given the results for the period February 25 - March 24, it was reasonable to have performed a survey of the individual's activities, to include comparison of results of dosimetry of others in like exposure areas, surveys of areas and conditions in which the individual was exposed to radiation would have been made or requested.

Failure to perform surveys or evaluations of the radiation hazards incident to the use of radiation producing sources is an apparent violation of 10 CFR 20.201(b).

- c. The licensee had not, as of August 1, 1990, notified the Commission or the individual of the overexposure of the individual to 3,620 mrem in a calendar quarter. A report of an overexposure is required within 30 days. The licensee had not recognized the existence of an overexposure prior to the inspector's inquiry during the inspection.

Failure to report an overexposure to the Commission within 30 days is an apparent violation of 10 CFR 20.405(a).

- d. The licensee is required to report in the first calendar quarter of each year, a summary, broken down by exposure ranges, of all its personnel who received occupational radiation exposure during the previous calendar year. The inspector determined that the licensee had not filed the required report for 1989 and 1988.

Failure to file required reports of personnel monitoring is an apparent violation of 10 CFR 20.407(b).

### 3. Transportation of Radioactive Materials

The inspector reviewed the licensee's program for transportation of licensed materials with respect to the criteria in 10 CFR Part 71 and 49 CFR Parts 171 - 177 (Department of Transportation).

NRC grants a general license to its licensees for the use of NRC approved shipping packages when a licensee completes certain requirements. The licensee uses NRC approved shipping packages for transporting licensed radiography sources to and from temporary job sites, and returning decayed sources to the vendor. These shipments are made both by private carrier (ie: the licensee's vehicles) and by common carrier.

The inspector verified the licensee's quality assurance program for shipping packages as registered with NRC in accordance with 10 CFR Part 71, Docket No. 071-00659. The licensee prepares proper shipping papers, surveys packages properly, labels and special form certifications are retained.

The licensee has not registered with NRC as a secondary user of the Amersham 660 radiography device (NRC Certificate of Compliance 9033) and the Amersham Model 650 source changer (NRC Certificate of Compliance 9032). Failure to register with NRC prior to first use is an apparent violation of 10 CFR 71.12(c) granting a general license.

#### 4. Surveys

The inspector reviewed the licensee's program to ensure posting of radiation and high radiation areas at field radiography sites and at temporary storage locations. The inspector also examined the authorized storage location in Woodbridge, Virginia.

The inspector surveyed the permanent licensed materials storage area and determined that the location is properly labeled for radioactive materials and does not require posting as a radiation area. Licensed materials are properly secured against unauthorized and/or accidental removal from the place of storage.

During radiography operations at a field site in Washington, D. C. on July 31, 1990, a high radiation area was present on the vacant floor above the radiography source. Although the area was controlled by an individual, a sign marking the area as a high radiation area was still required. Failure to post a high radiation area is an apparent violation of 10 CFR 20.203(c)(1).

#### 5. Training of Radiographers

The inspector reviewed the licensees training program for radiographers and radiographer's assistants against the program contained in the license application and the topics in 10 CFR Part 34 Appendix A.

The licensee maintains records for each individual which contain certifications of past qualifications, tests for qualifications, results of practical examinations and oral tests.

No violations were identified.

6. Radiographer Audit Program

The inspector reviewed the licensee's efforts at audits of radiographers and assistant radiographers. A radiography license applicant is required by 10 CFR 34.11(d) to submit a program which will provide for a quarterly inspection of the radiography operations of each individual. If an individual does no radiography within three months of the last inspection, an inspection of his conduct of radiography must be performed when next performing radiography. The program is to apply to all persons acting as radiographers or assistant radiographers.

The licensee's application for a radiography license does not contain clear reference to an inspection program. The application package does contain a reference to a quarterly assistant radiographer's inspection and a form calling for a radiographer's quarterly inspection. The licensee to this date has interpreted the requirements as calling for a quarterly inspection of a single individual.

The licensee's Radiation Safety Officer has performed radiography on an infrequent schedule since 1988. No inspection has been recorded of his radiography performance. The inspector determined that two radiographers were inspected properly through their employment period as radiographers. The inspector determined that the performance of one radiographer, still employed with the licensee, had not been inspected during two periods exceeding three months: January 16 through July 24, 1990 and August 16, 1989 through January 16, 1990.

No violations were identified.

7. Utilization and Maintenance Records

The inspector reviewed the licensee's performance of required maintenance and utilization records against the requirements of 10 CFR 34.27 and 34.28.

No violations were identified.

8. Survey Meters and Self-reading Dosimeters

The inspector reviewed the licensee's program for maintenance and calibration of survey meters, self-reading dosimeters and alarming dosimeters against the requirements of 10 CFR 34.24, 34.43, and 34.33.

No violations were identified.

9. Inventory and Leak Tests

The inspector reviewed the quarterly radioisotopic inventory and six-month sealed source leak test results against the requirements in 10 CFR Part 34. Procurement of sources has been from authorized suppliers and no source has exceeded the authorized strength.

No violations were identified.

10. Exit Interview

The inspector conducted an exit interview at the conclusion of the inspection with the individual noted in Paragraph 1. The inspector summarized the scope and the findings of the inspection. No dissenting comments were made by the licensee.