ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 030-20836/95-01

License: 25-21479-01

Licensee: Mattingly Testing Services, Inc.
P.O. Box 3126
Great Falls, Montana 59403

Facility Name: Mattingly Testing Services, Inc.

Inspection At: Billings, Montana; Fort Shaw, Montana;
and a temporary jobsite near Miles City, Montana

Inspection Conducted: January 4-24 and February 16, 1995

Inspector: Mark R. Shaffer, Senior Radiation Specialist

Approved: Linda L. Howell 2/28/95
Linda L. Howell, Chief, Nuclear Materials Inspection Branch — Date

Inspection Summary

Areas Inspected: Special, unannounced inspection of licensed activities involving use of byproduct materials for industrial radiography. The inspection included a review of licensee organization, management, and training; the licensee's internal audit programs; licensee facilities and equipment; personnel radiation protection and radiation surveys; notification and reports; and receipt, transfer, and transportation of licensed material. This inspection was conducted at the licensee's offices and storage locations in Billings and Fort Shaw, Montana, and at a temporary jobsite location near Miles City, Montana.

Results:

- An apparent violation involving the licensee's failure to notify NRC of a storage and use location in Billings, Montana, which had been in use for over a year but which was not authorized under the license was identified. The licensee's radiation safety officer (RSO) stated that the failure to amend the license was in part due to financial considerations in that he had delayed requesting amendment of the license until he could determine whether the Billings office would be profitable.

- Apparent violations involving failures to train radiation workers, coupled with common practices of failure to post radiation and high radiation areas, failure to survey exposure devices, and failure to secure sealed sources created a potential for significant health and safety consequences.

- Licensee management, including the company president/RSO and assistant RSO, were aware that some of the apparent violations existed but failed to take actions to correct the problems. In addition, a radiographer who supervised assistants was also aware of apparent violations but failed to take action to correct them. The number and nature of apparent violations identified during the inspection, coupled with management's knowledge of certain apparent violations, raised serious questions regarding management's commitment to compliance with safety requirements and NRC regulations.

Summary of Inspection Findings:

- Apparent Violation 03020836/9501-01 was opened: Failure to provide adequate training to two individuals prior to permitting them to act as radiographer's assistants as required under 10 CFR 34.31(b) (Section 2).

- Apparent Violation 03020836/9501-02 was opened: Failure to provide hazmat employees with training required under 49 CFR 172.700-704 (Section 2).

- Apparent Violation 03020836/9501-03 was opened: Failure to observe the performance of each radiographer and radiographer's assistant during an actual radiographic operation at 3-month intervals as required by 10 CFR 34.11(d)(1) (Section 3).

- Apparent Violation 03020836/9501-04 was opened: Failure to limit the storage of licensed material to the location identified in Item 3 of the license application dated July 25, 1989 (Section 4).

- Apparent Violation 03020836/9501-05 was opened: Failure to leak test sealed sources prior to transfer as required by License Condition 13 (Section 4).

- Apparent Violation 03020836/9501-06 was opened: Failure to make adequate surveys (evaluations) of personnel exposures following occasions when film badges were either misplaced or damaged as required under 10 CFR 20.1501 (Section 5).

- Apparent Violation 03020836/9501-07 was opened: Failure of the licensee to review, at least annually, the radiation safety program content and implementation as required under 10 CFR 20.1101(c) (Section 5).

- Apparent Violation 03020836/9501-08 was opened: Failure of a radiographer to watch the radiographer's assistant's performance of radiographic operations as required under 10 CFR 34.44 (Section 6).

- Apparent Violation 03020836/9501-09 was opened: Failure to survey the radiographic exposure device after each exposure to determine that the sealed source was returned to its shielded position as required under 10 CFR 34.43(b) (Section 6).

- Apparent Violation 03020836/9501-10 was opened: Failure to secure a sealed source in a shielded position following each exposure as required under 10 CFR 34.22(a) (Section 6).

- Apparent Violation 03020836/9501-11 was opened: Failure to conspicuously post radiation and high radiation areas with a sign or signs bearing the radiation caution symbol and the words "CAUTION, RADIATION AREA" and "CAUTION, HIGH RADIATION AREA" as required under 10 CFR 20.1902(a) and (b), respectively (Section 6).

- Apparent Violation 03020836/9501-12 was opened: Failure to adequately describe hazardous material on shipping papers in a manner required by Subpart C of 49 CFR Part 172 when radiographic exposure devices were transported outside the confines of the licensee's facility (Section 8).

Attachments:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 PROGRAM OVERVIEW

The licensee possessed six exposure devices containing iridium-192 for use in industrial radiography and maintained two permanent office locations where byproduct material was stored and dispatched to temporary jobsites. The majority of licensed activities were performed at temporary jobsite locations within the state of Montana. At the time of the inspection, the licensee employed five radiographers and two radiographer's assistants (assistant).

2 ORGANIZATION, MANAGEMENT, AND TRAINING (87100)

The inspector reviewed the licensee's organizational structure and noted that the Radiation Safety Officer (RSO) and other key personnel were as identified in the license application. Key personnel associated with the radiation safety program had been functioning in their present positions during previous NRC inspections.

The inspector reviewed training records for radiographers and assistants engaged in licensed activities, including records associated with on-the-job training as well as written and oral test records required under 10 CFR 34.31. Licensee records indicated that adequate training had not been provided to two assistants prior to their assignments at temporary jobsites. Specifically, the licensee had permitted two individuals to act as assistants without having demonstrated: (1) their competence to use, under the personal supervision of a radiographer, the radiographic exposure devices, sealed sources, related handling tools, and radiation survey instruments that the assistants later used; and (2) their understanding of instructions provided to them through successful completion of a written or oral test and field examination on the subjects covered.

Interviews with one assistant revealed that although the licensee had employed him as an assistant on December 30, 1994, he had not received appropriate training prior to conducting licensed activities on January 3, 1995. Based on interviews conducted with the assistant, the assistant RSO, and other licensee employees, it was determined that the assistant had received some instruction in the operation of an exposure device and had been provided some written material to read. However, the assistant had not received specific instruction in use of all equipment later assigned to him, nor had he received specific instruction in the licensee's operating and emergency procedures or completed a written or oral test or field examination. This lack of training apparently contributed to poor radiation safety practices observed by the inspector during a field site inspection conducted at a temporary jobsite near Miles City, Montana on January 4, 1995, where the assistant was performing radiography without supervision of a radiographer.

10 CFR 34.31(b) requires that a licensee not permit any individual to act as a radiographer's assistant until the individual has: (1) received copies of and instruction in the licensee's operating and emergency procedures;

(2) demonstrated competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, related handling tools, and radiation survey instruments that the assistant will use; and (3) demonstrated understanding of the above by successfully completing a written or oral test and field examination on the subjects covered. The failure to train the assistant who was observed on January 4, 1995, was later acknowledged by the RSO and assistant RSO who stated that although they had given some instruction to the assistant prior to assigning him work in the field, they realized that the assistant had not taken a written examination nor completed all training specified in the license application. In regard to the second assistant, who worked for the licensee from August 1992 to February 1994, the RSO admitted that the individual's training must have been overlooked.

The failure to provide training to two assistants prior to assigning them work using licensed materials at temporary jobsites was identified as an apparent violation of 10 CFR 34.31(b) (Apparent Violation 03020836/9501-01). (The specific observations made at the temporary jobsite on January 4, 1995, are discussed in Section 6 of this report.)

The inspector also reviewed the licensee's training program relative to transportation of hazardous material (iridium-192). 49 CFR 172.702(a) requires that a hazmat employer ensure that each of its hazmat employees is trained in accordance with the requirements prescribed in 49 CFR 172.700-704. 49 CFR 172.704(c)(1)(i) requires that training for a hazmat employee employed on or before July 2, 1993, be completed prior to October 1, 1993. 49 CFR 172.704(c)(2) requires that the hazmat employee receive this training at least once every 2 years.

Through discussions with licensee personnel, the inspector determined that the licensee had not provided hazmat training in accordance with the above noted Department of Transportation (DOT) regulations. Specifically, some employees had not received general awareness/familiarization training designed to provide familiarity with DOT requirements and to enable the employee to identify hazardous materials consistent with current hazard communication standards. In addition, some employees who received the training over two years ago had not received the required refresher hazmat training within the past two years. This was identified as an apparent violation of 49 CFR 172.702(a) (Apparent Violation 03020836/9501-02).

3 INTERNAL AUDITS AND INSPECTIONS (87100)

10 CFR 34.28 requires that radiographic equipment be checked for defects prior to use each day and inspected at intervals not to exceed 3 months. The licensee had maintained site area radiation survey records for each job which indicated that radiographers had checked radiographic equipment prior to use each day. The licensee had also maintained adequate records to indicate that the radiographic equipment had been inspected at the required 3-month intervals to ensure proper functioning of components important to safety.

10 CFR 34.11(d)(1) requires, in part, that an applicant have an inspection program that includes observation of the performance of each radiographer and radiographer's assistant during radiographic operations at intervals not to exceed 3 months. License Condition 17 incorporates the licensee's inspection program for radiographers, as described in the license application dated July 25, 1989, into NRC License 25-21479-01.

Through review of audit records and discussions with the licensee's RSO and assistant RSO, the inspector identified that the licensee had not observed the performance of a several radiographers involved in radiographic operations during intervals exceeding three months. Specifically, field audits were not performed during: (1) the first quarter of 1994 for four individuals, (2) the second quarter of 1994 for five individuals, (3) the third quarter of 1994 for three individuals, and (4) the fourth quarter of 1994 for three individuals. While each of the licensee's employees had missed at least two consecutive quarterly audits, one assistant had missed three consecutive quarterly audits and second assistant had never been audited. These individuals worked continuously throughout 1994 and required a field audit every 3 months. The failure to perform required field audits was identified as an apparent violation of 10 CFR 34.11(d)(1) (Apparent Violation 03020836/9501-03).

Both the RSO and assistant RSO acknowledged that they were aware of the requirement to perform quarterly field audits of radiographers; however, the RSO stated that the audits were likely not performed due to a heavy workload.

4 FACILITIES, INDEPENDENT MEASUREMENTS, AND EQUIPMENT (87100)

4.1 Facilities and Independent Measurements

Condition 17 of License No. 25-21479-01 requires, in part, that the licensee conduct its program in accordance with the statements, representations, and procedures contained in the application dated July 25, 1989. Item 3 of the application states that licensed material will be stored at 60 Clark Street, Fort Shaw, Montana. The inspector toured the licensee's office in Fort Shaw, Montana, from which licensed material was stored and dispatched to jobsites. Independent measurements taken by the inspector revealed that radiation levels were within regulatory limits for areas where licensed material was stored.

The inspection also identified that the licensee had not limited storage and use of licensed material to the office location in Fort Shaw, Montana. Specifically, in June 1994, the licensee established another storage and use location at 1739 North Frontage Road, Billings, Montana. An inspection conducted at the Billings office revealed that adequate security measures were in place to ensure safe storage of exposure devices.

During discussions of this issue with the RSO and assistant RSO, both individuals acknowledged that they were aware of the requirement to notify the NRC that a second facility had been used for storage of licensed material but failed to do so. Further, the RSO stated that the failure to amend the license was in part due to financial considerations in that he had delayed

requesting amendment of the license until he could determine whether the Billings office would be profitable. The assistant RSO, who managed the Billings office, acknowledged that he and the RSO had discussed the need to amend the license to identify the Billings location. The assistant RSO further stated that he had directed licensee employees working at the Billings office to state that the facility was not a permanent office if they were questioned by outside parties. In addition, the RSO stated that the licensee had been conducting business from the assistant RSO's residence in Billings, Montana, for over a year before the facility at 1739 Frontage Road was established.

The failure to amend the license to identify a second storage location was identified as an apparent violation of License Condition 17 (Apparent Violation 03020836/9501-04).

4.2 Radiographic Equipment

10 CFR 34.25(b) requires, in part, that each sealed source be tested for leakage at intervals not to exceed 6 months. License Condition 13 specifies that notwithstanding the periodic leak test requirements of 10 CFR 34.25(b), the requirement does not apply to radiography sources that are stored and not being used. The sources excepted from this test are required to be tested for leakage before use or transfer to another person.

Using information in the licensee's inventory records and utilization log, the inspector requested records of leak tests for several sealed sources which the licensee had received and used in radiographic operations. Inventory and utilization records revealed that the majority of sealed sources received by the licensee were returned to the manufacturer for disposal after approximately 5 months. Thus, these sources were not required to be leak tested. However, the inspector noted that two sources received by the licensee had been retained for a period greater than 6 months. Although the sources were not used to perform radiographic operations after 6 months had elapsed from their receipt, the licensee failed to perform a leak test on the sources prior to transferring them to the manufacturer for disposal. This was identified as an apparent violation of License Condition 13 (Apparent Violation 03020836/9501-05).

The inspector's review of sealed source inventory records disclosed that an adequate inventory of all byproduct material had been conducted at the required quarterly intervals. The most recent inventory was conducted on January 13, 1995.

5 PERSONNEL RADIATION PROTECTION AND RADIATION SURVEYS (83822, 87100)

The licensee had procured dosimetry services from an approved vendor and had used film badges which were exchanged at monthly intervals. The vendor had furnished the licensee with both monthly and annual dose reports. The average monthly whole body doses ranged from 45 to 200 millirem. A review of

The inspector noted that all licensee personnel who performed radiographic operations had been provided pocket dosimeters with a range of 0-200 milliroentgens and alarm ratemeters which were preset to alarm if exposed to radiation levels of 500 mr/hr. 10 CFR 34.33(c) requires that pocket dosimeters be checked at periods not to exceed 1 year for correct response to radiation. 10 CFR 34.33(f)(4) requires that alarm ratemeters be calibrated at periods not to exceed 1 year for correct response to radiation. Licensee records indicated that these devices had been calibrated and checked at the required frequencies.

6 INSPECTION AT TEMPORARY JOBSITE LOCATION (83822, 87100)

During an inspection conducted at a temporary jobsite near Miles City, Montana, on January 4, 1995, the inspector observed a licensee employee perform radiography. While observing the individual perform only two radiographs, the inspector identified several safety concerns.

10 CFR 34.44 requires that whenever an assistant uses radiographic exposure devices, sealed sources or related source handling tools, or conducts radiation surveys required by 10 CFR 34.43(b) to determine that the sealed source has returned to the shielded position after an exposure, the assistant must be under the personal supervision of a radiographer. As specified in 10 CFR 34.44, personal supervision must include; (1) the radiographer's personal presence at the site where sealed sources are being used, (2) the ability of the radiographer to give immediate assistance if required, and (3) the radiographer watching the assistant's performance of the operations noted above.

Upon arrival at the temporary jobsite on January 4, 1995, the inspector observed a single individual performing radiographic operations. Discussions with pipeline construction personnel on site revealed that this individual was recently employed by the licensee and was considered an assistant. The inspector was informed that the licensee's radiographer on site was developing film in the dark room while the assistant performed radiography (the inspector observed the assistant complete two exposures). At this time, the inspector asked the assistant to terminate licensed activities until the radiographer returned from the dark room and could watch the assistant perform radiographic operations. Shortly thereafter, the radiographer returned from the dark room and licensed activities resumed. The assistant completed the remainder of work for the day (three additional radiographs) under the supervision of the radiographer. During the observation of radiographic operations, the inspector performed independent measurements to verify that the sealed source was returned to the shielded position after each exposure. Additionally, it was noted that members of the public (pipeline construction workers) were cleared of the radiation area during radiographic operations.

The failure of the radiographer to provide personal supervision to the assistant as he performed radiographic operations was identified as an apparent violation of 10 CFR 34.44 (Apparent Violation 03020836/9501-08).

The radiographer present at this temporary jobsite later admitted to the inspector that he was aware of the requirement to provide personal supervision for assistants while they were performing radiography. Although the radiographer acknowledged that he had not provided supervision for the assistant at the time the NRC inspector was present, the radiographer stated that he had provided the required supervision earlier in the day.

10 CFR 34.43(b) requires, in part, that a licensee ensure that a survey with a calibrated and operable radiation survey instrument is made after each radiographic exposure to determine that the sealed source has been returned to its shielded position. The survey must include the entire circumference of the radiographic exposure device and any source guide tube. At the temporary jobsite noted above the inspector observed that the assistant failed to perform a survey of the entire circumference of the exposure device and the source guide tube after each exposure. The inspector noted that the assistant left his survey instrument on the ground next to the exposure device during each exposure. As he approached the device, the assistant looked at the meter to verify that the source was in the shielded position; however, the assistant did not pick up the instrument and survey the circumference of the device or the source guide tube. The failure to perform a survey of the circumference of the exposure device, including the source guide tube, was identified as an apparent violation of 10 CFR 34.43(b) (Apparent Violation 03020836/9501-09).

During discussions with the RSO regarding this observation, the RSO stated that he had instructed radiographers to leave one survey instrument near the exposure device and to carry one with them as they approached the device at the conclusion of an exposure. The radiographer working with the assistant on January 4 stated that he had shown the assistant how to perform a full survey of an exposure device but later instructed the assistant in his own method, which was to leave the survey instrument near the source exit port of the exposure device during radiographic exposures.

10 CFR 34.22(a) requires, in part, that during radiographic operations, the sealed source assembly be secured in the shielded position each time the source is returned to that position. On January 4, 1995, the inspector observed that an assistant failed to secure a sealed source assembly in a shielded position within an exposure device each time the source was returned to that position. The failure to fully secure a radiographic source following each exposure was identified as an apparent violation of 10 CFR 34.22(a) (Apparent Violation 03020836/9501-10).

Subsequent discussions with the RSO disclosed that he was aware of NRC's requirement to secure sources following each exposure; however, the RSO stated that he believed that retracting the source back into the exposure device provided adequate security with the specific exposure devices used by the licensee. The radiographer present during the inspection at this temporary jobsite also acknowledged that he was aware of the requirement to secure a radiographic source following each exposure, but indicated during interviews that he believed that when using the specific device in use on January 4 (a Gamma Century exposure device), that securing the source by locking the device

was not necessary. Other licensee employees indicated that the licensee's standard practice was to secure the source by locking the device only if it was to be moved to another location (next weld).

10 CFR 20.1902(a) requires that each radiation area be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words "CAUTION, RADIATION AREA." 10 CFR 20.1902(b) requires that each high radiation area be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words "CAUTION, HIGH RADIATION AREA" or "DANGER, HIGH RADIATION AREA."

During the inspection at a temporary jobsite on January 4, 1995, the inspector observed that the above noted signs were not posted at either the radiation area or the high radiation area where industrial radiography was being performed. This was identified as an apparent violation of 10 CFR 20.1902(a)&(b) (Apparent Violation 03020836/9501-11).

The RSO later acknowledged to the inspector that he was aware of the requirement to post radiation and high radiation areas while radiography was performed and that he was also aware that the required signs were not always posted when licensee employees were performing radiography on a pipeline. The radiographer also acknowledged that he too was aware of the requirement to post signs at radiation and high radiation areas, although he stated that he did not always use the signs. Both the RSO and radiographer stated that licensee employees instructed other workers in the area that radiography was being performed and that they needed to avoid the work area.

7 NOTIFICATIONS AND REPORTS (83822)

The RSO informed the inspector that no incidents, thefts, losses of licensed material, or overexposures had occurred requiring notification and/or report to NRC or the DOT.

The inspector reviewed the licensee's annual report of occupational doses which had been prepared to comply with 10 CFR 20.2206(b). The report had been prepared and submitted to the NRC as required. However, the inspector noted that some information in the report may not have been complete in that the reported total cumulative exposure received by some individuals may not have been correct. Specifically, as noted in Section 5 above, the licensee had not performed an evaluation of doses received by certain individuals during monitoring periods when badges were either misplaced or damaged; therefore, annual occupational dose reports and termination reports maintained by the licensee did not reflect the total cumulative exposure received by certain individuals. The inspector noted that the licensee had generally used records prepared by its dosemetry vendor to satisfy the above noted requirement. However, the vendor's records had not been corrected to include the dose received by some individuals during periods when badges were misplaced or damaged.

The inspector observed that areas for storage of licensed material had been properly posted, and exposure devices and containers were labeled appropriately. Current copies of NRC Form-3, appropriate regulations, and the license were posted at the licensee's facility in a readily visible location.

8 RECEIPT, TRANSFER, AND TRANSPORTATION (86740, 87100)

Subsequent to NRC's previous inspection, the licensee had received and transferred several iridium-192 sealed sources. Licensed materials had been delivered to common carriers and transported in the licensee's privately owned vehicles. The licensee had used NRC-approved Type B containers for transportation. Certificates of Compliance (COCs) had been maintained on file in accordance with 10 CFR 71.12(c)(1).

The licensee had maintained an NRC-approved Quality Assurance Program for Radioactive Materials Packages as required by 10 CFR 71.12(b). The licensee's approval No. 71-0542 is valid through June 30, 1995.

The radiographic exposure device observed during the field inspection conducted on January 4, 1995, had been transported to the temporary jobsite in the licensee's private vehicle. Radiation levels at the surface of the package were such that RADIOACTIVE YELLOW-II labels were used; therefore, the licensee's vehicle was not required to be placarded.

The inspector reviewed shipping papers associated with the package to verify compliance with 49 CFR 172.200-204. The licensee had provided each vehicle with a shipping paper which included much of the required information (proper shipping name, radionuclide, physical form, etc.). This document was laminated so that employees could update required information (date. destination, source activity, transport index, etc.) on each day the exposure device was transported. The inspector's review of the shipping paper prepared for transportation of an exposure device to a temporary jobsite on January 4, 1995, revealed that the radiographer had not updated required information on the shipping paper since November 17, 1994, although according to the radiographer, the shipping paper had been used in association with transportation of an exposure device to temporary jobsites on several occasions after November 17. Thus, much of the information necessary to describe the hazardous material that was transported to temporary jobsites was incorrect after November 17, 1994. The failure of the radiographer to prepare shipping papers which included all of the required information was identified as an apparent violation of 49 CFR 172.203(d) (Apparent Violation 03020836/9501-12).

The inspector also reviewed shipping papers prepared and used by the licensee for packages that were delivered to common carriers from January to December 1994. It was noted that all the required information was included on these documents.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

Samuel Bruno, Radiographer
Darin Hanson, Radiographer
Bart Kutt, Vice President, Field Supervisor
*Mark Mattingly, President and Radiation Safety Officer
Suzanne Mattingly, Chief Executive Officer
Dean Syring, Radiographer's Assistant
Michael Timmons, Radiographer

1.2 NRC Personnel

*Dennis N. Boal
*Mark R. Shaffer
Linda L. Howell

*Indicates those present during exit meeting on January 24, 1995

2 EXIT MEETINGS

A preliminary site exit briefing was conducted on January 24, 1995, with those individuals identified in Section 1. A formal exit briefing was conducted telephonically between Mr. Mark Mattingly and Ms. Linda L. Howell and Mr. Mark R. Shaffer on February 16, 1995, to review the specific findings as presented in the report.