



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, ILLINOIS 60532-4352

February 5, 2021

EA-21-002
EN 53620
NMED No. 180444 (closed)

Mr. Bruce Karie
Corporate Radiation Safety Officer
Acuren Inspection, Inc.
4566 Abrahamson Road
Duluth, MN 55811

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 03038913/2020002(DNMS) AND
NOTICE OF VIOLATION – ACUREN INSPECTION, INC.

Dear Mr. Karie:

On August 5, 2020, an inspector from the U.S. Nuclear Regulatory Commission (NRC) performed a routine inspection at your office in Duluth, Minnesota, with in-office review from June 29, 2020, to January 14, 2021. The purpose of the inspection was to review activities performed under your NRC license to ensure that activities were being performed in accordance with NRC requirements. The in-office review also included an evaluation of the circumstances surrounding an incident reported to the NRC on September 25, 2018, as well as an evaluation of the completion and effectiveness of corrective actions taken in response to escalated enforcement action issued by the NRC on March 3, 2020. Mr. Ryan Craffey of my staff conducted a final exit meeting by telephone with you on January 28, 2021, to discuss the inspection findings. This letter and its enclosures present the results of the inspection.

During this inspection, the NRC staff examined activities conducted under your license related to public health and safety. Additionally, the staff examined your compliance with the Commission's rules and regulations as well as the conditions of your license. Within these areas, the inspection consisted of the selected examination of procedures and representative records and interviews with personnel.

Based on the results of this inspection, the NRC has determined that three Severity Level IV violations of NRC requirements occurred. The violations were evaluated in accordance with the

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When separated from that Enclosure, this
transmittal letter and Enclosures 1 and 2
are decontrolled.

B. Karie

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NRC Enforcement Policy, which can be found on the NRC's website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>.

The first violation involved the failure on September 23, 2018, to follow emergency procedures for a safety equipment failure per Condition 23.A of your license. The second violation involved the failure to notify the NRC within 24 hours of this incident per Title 10 of the *Code of Federal Regulations* (10 CFR) 30.50(b)(2). The third violation involved the failure to submit a written report on the incident containing all required information to the appropriate recipients per 10 CFR 30.50(c)(2) and 10 CFR 34.101(b).

The violations are cited in the enclosed Notice of Violation (Enclosure 1). Further details, including the root causes and corrective actions as understood by NRC, are available in the narrative report (Enclosure 2). The NRC is citing the first violation because it was revealed through an event. The NRC is citing the second and third violations because they were identified by the inspector.

The NRC had previously cited Acuren Inspection, Inc. in IR 03038913/2017004(DNMS), issued on September 8, 2017, for a similar violation of 10 CFR 30.50(b)(2). Although we recognize that the root cause appears to be different from that of the most recent violation, we encourage periodic reinforcement of the reporting requirements with the staff at your various field locations to ensure sustained compliance with regulatory reporting requirements. However, this periodic reinforcement is not currently a requirement in either NRC regulations or the conditions of your NRC license.

The NRC has concluded that information regarding the reason for the violations, the corrective actions taken and planned to correct the violations and prevent recurrence, and the date when full compliance will be achieved is already adequately addressed on the docket in this letter and its enclosures. Therefore, you are not required to respond to this letter unless the description herein does not accurately reflect your corrective actions or your position. In that case, or if you choose to provide additional information, you should follow the instructions specified in the enclosed Notice.

In accordance with the NRC's "Rules of Practice" in 10 CFR 2.390, a copy of this letter and Enclosures 1 and 2 will be made available electronically for public inspection in the NRC's Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC's website at <http://www.nrc.gov/reading-rm/adams.html>. Enclosure 3, because it discusses security-related information, will not be made available electronically for public inspection nor will any response that you may provide to that Enclosure. If you do respond to Enclosure 3, please mark the top of each page with "Security-Related Information – Withhold Under 10 CFR 2.390." To the extent possible, any response to Enclosures 1-3 should not include any personal privacy, proprietary, or safeguards information so that it can be made publicly available without redaction.

B. Karie

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Please feel free to contact Mr. Craffey of my staff if you have any questions regarding this inspection. Mr. Craffey can be reached at (630) 829-9655 or ryan.craffey@nrc.gov.

Sincerely,

Michael Kunowski, Chief
Materials Inspection Branch
Division of Nuclear Materials Safety

Docket No. 030-38913
License No. 22-27593-01

Enclosures:

1. Notice of Violation (publicly available)
2. IR 03038913/2020002(DNMS) (publicly available)
3. Security Addendum (non-public)

cc w/encl 1 and 2: State of Minnesota
State of Wyoming

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B. Karie

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Letter to B. Karie from M. Kunowski, dated February 5, 2021.

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 03038913/2020002(DNMS) AND
NOTICE OF VIOLATION – ACUREN INSPECTION, INC.

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OFFICE	RIII-DNMS		RIII-EICS		RIII-DNMS			
NAME	RCraffey:brt	rjc3	JCameron		MKunowski			
DATE	02/01/21		02/02/21		02/05/21			

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NOTICE OF VIOLATION

Acuren Inspection, Inc.
Duluth, Minnesota

License No. 22-27593-01
Docket No. 030-38913
EA-21-002

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted on August 5, 2020, with in-office review from June 26, 2020 to January 14, 2021, three violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Condition 23.A of NRC Materials License No. 22-27593-01, Amendment No. 7, dated June 5, 2018, states, in part, that Acuren Inspection, Inc. shall conduct its program in accordance with the statements, representations, and procedures contained in its application dated September 11, 2015.

The application dated September 11, 2015, included the licensee's Radiographic Operating and Emergency Manual (ROEM), Revision 7, dated July 25, 2015. Section 1.2 of Appendix 13, Radiography Emergency Procedures, to the ROEM states that, when a sealed source cannot be retracted, the radiographer shall not attempt to retrieve the sealed source.

Contrary to the above, on September 23, 2018, a radiographer working for Acuren Inspection, Inc. at a temporary job site in Sinclair, Wyoming, attempted to retrieve a sealed source of iridium-192 that could not be retracted because of a bend in the guide tube. Specifically, the radiographer straightened the guide tube by pulling on the radiography camera, allowing the source to be retracted.

This is a Severity Level IV violation (Section 6.3.d.3).

- B. Title 10 of the *Code of Federal Regulations* (10 CFR) 30.50(b)(2) states, in part, that each licensee shall notify the NRC within 24 hours after the discovery of an event involving licensed material in which equipment is disabled or failed to function as designed when (i) The equipment is required by regulation or license condition to prevent exposures to radiation and radioactive materials exceeding regulatory limits; (ii) The equipment is required to be available and operable when it is disabled or fails to function; and (iii) No redundant equipment is available and operable to perform the required safety function.

Contrary to the above, on September 24, 2018, Acuren Inspection, Inc. failed to notify the NRC within 24 hours after the discovery of an event involving licensed material in which radiographic equipment failed to function as designed. Specifically, a guide tube fell from the wall of a tank, bending in such a way that the source containing iridium-192 could not be returned to the shielded position, and the licensee did not notify the NRC until approximately 43 hours after it was discovered.

This is a Severity Level IV violation (Section 6.9.d.1).

Enclosure 1

- C. Title 10 CFR 30.50(c)(2) states that each licensee who makes a report required by paragraph (a) or (b) of this section shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the reports contain all of the necessary information and the appropriate distribution is made. These written reports must be sent to the NRC using an appropriate method listed in § 30.6(a); and a copy must be sent to the appropriate NRC Regional office listed in appendix D to part 20 of this chapter. The reports must include the following: (i) A description of the event, including the probable cause and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned; (ii) The exact location of the event; (iii) The isotopes, quantities, and chemical and physical form of the licensed material involved; (iv) Date and time of the event; (v) Corrective actions taken or planned and the results of any evaluations or assessments; and (vi) The extent of exposure of individuals to radiation or to radioactive materials without identification of individuals by name.

Title 10 CFR 34.101(a)(2) states that, in addition to the reporting requirements specified in § 30.50 and under other sections of this chapter, such as § 21.21, each licensee shall send a written report to the NRC's Office of Nuclear Material Safety and Safeguards, by an appropriate method listed in § 30.6(a) of this chapter, within 30 days of the occurrence of an inability to retract the source assembly to its fully shielded position and secure it in this position.

Title 10 CFR 34.101(b) states that the licensee shall include the following information in each report submitted under paragraph (a) of this section, and in each report of overexposure submitted under 10 CFR 20.2203 which involves failure of safety components of radiography equipment: (1) A description of the equipment problem; (2) Cause of each incident, if known; (3) Name of the manufacturer and model number of equipment involved in the incident; (4) Place, date, and time of the incident; (5) Actions taken to establish normal operations; (6) Corrective actions taken or planned to prevent recurrence; and (7) Qualifications of personnel involved in the incident.

Contrary to the above:

1. On October 26, 2018, Acuren Inspection, Inc. failed to submit a written follow-up report containing all required information to the appropriate NRC Regional office within 30 days of the initial report on September 25, 2018. Specifically, the licensee submitted a written follow-up report to the NRC's Operations Center on September 25, 2018, but not to the appropriate NRC Regional office until June 12, 2020. Moreover, the report did not contain information on the equipment that failed or malfunctioned as required by subsection (i), nor did it contain the information required by subsection (vi).
2. On October 24, 2018, Acuren Inspection, Inc. failed to send a written report containing all required information to the NRC's Office of Nuclear Material Safety and Safeguards within 30 days of the event on September 23, 2018. Specifically, the licensee sent a written report to the NRC's Operations Center on September 25, 2018, but not to the NRC's Office of Nuclear Material Safety and Safeguards. Moreover, the report did not contain information on the equipment

involved in the incident as required by subsection (3), nor did it contain the information required by subsection (7).

This is a Severity Level IV violation (Section 6.9.d.7).

The NRC has concluded that information regarding the reason for the violations, the corrective actions taken and planned to correct the issues and prevent recurrence, and the date when full compliance was achieved, is already adequately addressed on the docket in the subject inspection report. However, you are required to submit a written statement or explanation pursuant to 10 CFR 2.201 if the description therein does not accurately reflect your corrective actions or your position. In that case, or if you choose to respond, clearly mark your response as a "Reply to a Notice of Violation, IR 03038913/2020002(DNMS)" and send it to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region III, within 30 days of the date of the letter transmitting this Notice.

If you choose to respond, your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days of receipt.

Dated this 5th day of February 2021.

**U.S. Nuclear Regulatory Commission
Region III**

Docket No.	030-38913
License No.	22-27593-01
Report No.	03038913/2020002(DNMS)
EA No./NMED No.	EA-21-002 NMED 180444 (closed)
Licensee:	Acuren Inspection, Inc.
Facility:	4566 Abrahamson Road Duluth, Minnesota
Inspection Dates:	August 5, 2020, with in-office review from June 26, 2020, to January 14, 2021
Exit Meeting Date:	January 28, 2021
Inspector:	Ryan Craffey, Health Physicist
Approved By:	Michael Kunowski, Chief Materials Inspection Branch Division of Nuclear Materials Safety

Enclosure 2

EXECUTIVE SUMMARY

**Acuren Inspection, Inc.
NRC Inspection Report 03038913/2020002(DNMS)**

This was an announced routine inspection of a non-destructive testing company authorized by U.S. Nuclear Regulatory Commission (NRC) Materials License No. 22-27593-01 to possess and use radioactive material for industrial radiography and portable gauging in NRC jurisdiction. The inspection included (1) a review of the licensee's radiation safety and security programs; (2) a review of an incident involving a stuck radiography source reported to the NRC on September 25, 2018; and (3) an evaluation of the completion and effectiveness of corrective actions following an escalated enforcement action issued by the NRC on March 3, 2020.

As a result of the review of the continued implementation of the licensee's radiation safety and security programs, no violations were identified.

As a result of the review of the 2018 incident, three Severity Level IV violations of NRC requirements were identified: (1) failure to follow emergency procedures for a safety equipment failure per License Condition 23.A; (2) failure to notify the NRC within 24 hours of this incident per Title 10 of the *Code of Federal Regulations* (10 CFR) 30.50(b)(2); and (3) failure to submit a written report of this incident containing all required information to the appropriate recipient as required by 10 CFR 30.50(c)(2) and 10 CFR 34.101(b).

As a result of the review of the corrective actions for the escalated enforcement action issued in March 2020, the inspector found that the corrective actions were complete and effective, and that similar violations had not occurred again since. Therefore, these violations are closed.

REPORT DETAILS

1 Program Overview and Inspection History

Acuren Inspection, Inc., d/b/a WIT Pipeline, TEI, Acuren Pipeline, and Lehigh Testing Laboratories (the licensee), is a multinational nondestructive testing company authorized for industrial radiography and portable gauges at numerous field offices and temporary job sites in NRC jurisdiction. The licensee's radiation safety program was overseen by its Corporate Director of Radiation Safety (Corporate Radiation Safety Officer (RSO)) in Duluth, Minnesota, assisted by two Regional Radiation Safety Directors, one in Indiana and one in Texas. Daily responsibilities for the implementation of the program were delegated to Site RSOs, who were assigned one or more authorized location of use. At the time of the inspection, the licensee had over 900 radiography personnel on staff across all jurisdictions.

The last routine inspection of the licensee's radiation safety program was on February 26, 2019. No violations of NRC requirements were identified as a result of this inspection.

Since then, the NRC has performed field inspections of the licensee's authorized locations in New Castle, Delaware (July 17, 2019), Billings, Montana (August 26, 2019), and Indianapolis, Indiana (January 29, 2020). A temporary job site inspection was also performed in Bargersville, Indiana (January 29, 2020). As a result of these inspections, a Severity Level IV violation was identified in Billings for the failure to provide annual refresher safety training for radiographers and assistants per Title 10 of the *Code of Federal Regulations* (10 CFR) 34.43(d), and a minor violation was identified in New Castle for using a sealed source that had not been leak tested within the required frequency per 10 CFR 34.27(c)(1).

The NRC also performed a reactive inspection in Billings on November 5, 2019, to review the circumstances surrounding an event of a security-related nature reported to the NRC on September 18, 2019. As a result of this inspection (IR 03038913/2019004 (DNMS)), violations of NRC security requirements were identified, and a civil penalty was imposed.

2 Radiation Safety Program

2.1 Inspection Scope

The inspector evaluated the scope, status, and continued oversight of the licensee's radiation safety program through interviews with Agreement State and NRC personnel and the Corporate RSO, and a review of records.

2.2 Observations and Findings

During the period of in-office review, the inspector discussed the licensee's response to several reportable events since the last NRC routine inspection with personnel from Agreement States and the NRC, in order to evaluate the program's oversight and support of its field offices.

During the on-site inspection, the inspector and RSO discussed the status and oversight of activities performed under the license and reviewed the results of several field office audits completed since the last NRC routine inspection. The inspector and the RSO also reviewed and discussed the content and completion of periodic radiation safety training for radiographic personnel and for site RSOs. The inspector and the RSO discussed the impact of the COVID-19 public health emergency (PHE) on safe operations and compliance with NRC requirements (nothing of significance to report as of the date of the onsite inspection on August 5, 2020, nor as of the date of the exit meeting on January 28, 2021).

2.3 Conclusions

The inspector had no findings in this area.

3 **Stuck Source Incident (Event Number 53620)**

3.1 Inspection Scope

The inspector evaluated the circumstances, root and contributing causes, and the licensee's response to a September 2018 incident involving a stuck radiography source through interviews with the Corporate RSO, the Division Manager and current Site RSO for the field office in Commerce City, Colorado, and the radiographer involved in the incident. The inspector also reviewed a selection of records and performed independent calculations of radiation exposure received from the incident.

3.2 Sequence of Events and Response

A. Sequence of Events

On Sunday, September 23, 2018, the licensee dispatched a crew from its field office in Commerce City to a refinery in Sinclair, Wyoming. The crew consisted of two radiographers (one with 5 years of experience with radiographic operations, the other 17), and had been dispatched to radiograph welds on a 100-foot diameter oil storage tank under construction at the refinery.

The crew was performing their twentieth exposure that day when, around 2:00 pm, the magnetic stand they were using to support the camera's guide tube and tungsten collimator fell from the wall of the tank. The stand, with collimator still attached, landed in such a way that the guide tube became coiled well beyond the manufacturer's recommended operational limit of a 36-inch bend radius. As such, the crew was initially unable to retract the source to the safe, shielded position.

The crew then dragged the camera by the cranks towards the center of the tank to minimize exposure around its exterior. They called the Site RSO for Commerce City, who was qualified to perform source retrievals but was away on vacation. He directed them to return the source to the collimator, add shielding, and keep other personnel away from the restricted area while he began to mobilize source retrieval resources.

The crew did as they were instructed. One radiographer stood at the entrance to the tank to control access (there were few, if any, other people present at the time), while the other proceeded to place fifteen lead-lined film cassettes atop the collimator on one approach, and two half-inch thick steel plates on another. During this second approach, however, the radiographer decided to stop at the camera and pull on it against the now-weighted collimator to attempt relieving the bend in the guide tube. This straightened the guide tube sufficiently to allow the source to be retracted on a subsequent attempt. The crew thereafter halted operations for the day, contacted the Site RSO again to report their resolution of the situation, and returned to their field office around 9:00 pm.

Condition 23.A of NRC Materials License No. 22-27593-01, Amendment No. 7, dated June 5, 2018, states, in part, that the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in its application dated September 11, 2015.

The application dated September 11, 2015, included the licensee's Radiographic Operating and Emergency Manual (ROEM), Revision 7, dated July 25, 2015. Section 1.2 of Appendix 13, Radiography Emergency Procedures, to the ROEM states that, when a sealed source cannot be retracted, the radiographer shall not attempt to retrieve the sealed source.

The radiographer's attempt to retrieve the source is a violation of Condition 23.A of Acuren's license and was revealed through the event.

The inspector determined that root cause of the violation was the radiographer's lack of understanding of emergency procedures. The radiographer did not believe at the time that his actions constituted a source retrieval, because it did not involve handling a detached source, disassembling radiography equipment, or other similarly high-risk activities. The radiographer indicated that he would not have made further attempts to retrieve the source had straightening of the guide tube not succeeded.

Since the radiographer's actions were reasonably within the scope of his training and experience as a radiographer and appear to have been conducted safely (see Section 3.4.B below for more detail), the NRC determined that the violation represented a safety concern primarily as a failure to follow procedures, rather than as inadequate qualifications, experience, or training of the personnel involved. Therefore, the NRC characterized this violation as a Severity Level IV in accordance with example 6.3.d.3 of the NRC Enforcement Policy.

B. Licensee's Response and Corrective Actions

The next morning, on September 24, 2018, the Division Manager for Commerce City performed an initial assessment of the radiographic equipment involved in the incident and had the crew's personnel dosimeters sent for emergency processing. The morning after that, on September 25, the Site RSO returned from vacation and performed his own assessment of the equipment. He concluded that the cranks and camera were operational and could be returned to service, but that the guide tube should be removed from service as a precaution. He also had the crew's direct

reading dosimeters sent for evaluation because the radiographer who attempted to retrieve the source reported that his direct reading dosimeter had gone off-scale.

The personnel dosimeter for the radiographer who attempted the retrieval read 76 millirem (mrem) deep-dose equivalent (DDE) for the month and was confirmed by the dosimetry provider to be valid with no anomalies. The Site RSO performed a cursory assessment of exposure and calculated that 26 mrem of this dose was from the incident. However, this assessment considered only one set of parameters (radiation intensity, shielding, position and time) and did not comprehensively correlate to the radiographer's actions. At the inspector's request, in early December 2020 the current Site RSO for Commerce City performed a detailed reenactment of the radiographer's actions and recalculated his exposure from the incident at just under 13 mrem.

In addition, the current Site RSO reviewed past utilization logs and confirmed that the individual had only performed radiographic operations that month on the day of the incident and the day prior under similar operational conditions. His dose for this work as measured by direct reading dosimetry was documented to be 60 mrem: 40 mrem from 40 shots on September 22, 2018, and an estimated 20 mrem from the 20 shots on September 23. Therefore, the licensee concluded that his personnel dosimeter had recorded 16 mrem of exposure from the incident itself.

The licensee further concluded that the other radiographer received an insignificant amount of additional exposure from the incident, as he remained outside the tank at the perimeter of the restricted area throughout. His personnel dosimeter read 103 mrem, the result of additional days that month performing other radiographic operations with a different crew member.

The direct reading dosimeters for the two radiographers involved in the September 23 event were subsequently evaluated by an authorized service provider. One dosimeter was functional but the dosimeter that went off-scale during the incident was found to be beyond repair; the center pin had broken, causing the dosimeter to drift. The licensee concluded that the dosimeter, which was successfully zeroed on the morning of the incident and was in the radiographer's possession throughout, had been impacted or otherwise damaged that day, and that the off-scale recording was not a valid indication of actual exposure.

The licensee determined the root cause of the incident to be the failure of the magnetic stand to perform its intended function. As a contributing factor, the licensee identified that it does not have a standard model of stand, and that this one may not have been stable for service. Additionally, the licensee postulated that the crew may not have checked the stand's magnets for debris, which could have decreased their effectiveness.

As corrective action, the licensee discussed the incident with the individuals involved and reminded them that source retrievals should be performed by the RSO or trained management as stated in emergency procedures, and that they should always properly secure magnetic stands with a safe line while performing radiography at any elevation. The licensee also outsourced a welder to manufacture a new model of magnetic stand to be used for radiography operations on tanks or other projects that

require radiography at elevation. Further, a “Lessons Learned” memo was sent to all employees followed by a safety stand down with them to discuss the event and emphasizing that source retrievals are only to be performed by qualified individuals. Spot checks of employees were also subsequently performed periodically with incident scenarios and retraining to reinforce that source retrievals are only to be performed by qualified individuals.

The licensee subsequently reassigned the radiographer who attempted to retrieve the source to other duties not involving radiographic operations. The licensee’s management in Commerce City also made arrangements to obtain the services of trained and qualified retrieval personnel from another nondestructive testing company in Wyoming, in the event that the Site RSO for Commerce City is unable to respond in a timely fashion to a stuck source or other similar incident in the state.

3.3 Notification and Reporting

A. Immediate Notification

The incident occurred at approximately 2:00 pm Mountain Time (4:00 pm Eastern Time) on September 23, 2018. The Site RSO at the time for Commerce City contacted the NRC Operations Center at approximately 11:00 am Eastern time on September 25, 2018, 43 hours later. The notification resulted in Event No. 53620, reportable under 10 CFR 30.50(b)(2) as an event in which equipment is disabled or fails to function as designed when the equipment is required by regulation or license condition to prevent exposures to radiation and radioactive materials exceeding regulatory limits, and was recorded in the Nuclear Materials Events Database (NMED) under Item No. 180444.

Title 10 CFR 30.50(b)(2) states, in part, that each licensee shall notify the NRC within 24 hours after the discovery of an event involving licensed material in which equipment is disabled or failed to functioned as designed when (i) the equipment is required by regulation or license condition to prevent exposures to radiation and radioactive materials exceeding regulatory limits; (ii) the equipment is required to be available and operable when it is disabled or fails to function; and (iii) no redundant equipment is available and operable to perform the required safety function.

The licensee’s failure to report this event within 24 hours of its discovery is a Severity Level IV violation of 10 CFR 30.50(b)(2) in accordance with example 6.9.d.1 of the NRC Enforcement Policy.

The inspector determined that the root cause of the violation was a misunderstanding of regulatory requirements. The Corporate RSO stated that the Site RSO at the time incorrectly believed that the equipment failure was not significant or permanent enough to be reportable.

As corrective action, the Corporate RSO, upon learning of the incident, reiterated the regulatory requirements to the Site RSO at the time and instructed him to immediately report the matter to the NRC. The Corporate RSO also retrained all Site RSOs on reporting requirements at a subsequent monthly call with them.

B. Written Report

The licensee submitted a written report via e-mail to the NRC Operations Center on September 25, 2018. However, the licensee did not include the appropriate NRC Regional office (Region III) or the NRC Office of Nuclear Materials Safety and Safeguards on this correspondence. As a result, this report was not received by Region III until June 12, 2020, following an inspector's inquiry into the missing report. The report contained information that would have been required by 10 CFR 30.50(c)(2) except for the manufacturer and model number of any equipment that failed or malfunctioned, and the extent of exposure to individuals. It also contained information that would have been required by 10 CFR 34.101(b) except for the name of the manufacturer and model number of equipment involved in the incident, and the qualifications of personnel involved in the incident.

The licensee also submitted information on October 10, 2018, to a Region III inspector performing the initial assessment of the event. Within the scope of information required by the aforementioned requirements, this documentation only included details clarifying the original description of the event, as well as the manufacturer and the model number of some (but not all) of the equipment involved in the incident, and the extent of exposure of individuals involved in the incident.

Title 10 CFR 30.50(c)(2) states that each licensee who makes a report required by paragraph (a) or (b) of this section shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the reports contain all of the necessary information and the appropriate distribution is made. These written reports must be sent to the NRC using an appropriate method listed in § 30.6(a); and a copy must be sent to the appropriate NRC Regional office listed in appendix D to part 20 of this chapter. The reports must include the following: (i) a description of the event, including the probable cause and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned; (ii) the exact location of the event; (iii) the isotopes, quantities, and chemical and physical form of the licensed material involved; (iv) date and time of the event; (v) corrective actions taken or planned and the results of any evaluations or assessments; and (vi) the extent of exposure of individuals to radiation or to radioactive materials without identification of individuals by name.

Title 10 CFR 34.101(a)(2) states that, in addition to the reporting requirements specified in § 30.50 and under other sections of this chapter, such as § 21.21, each licensee shall send a written report to the NRC's Office of Nuclear Material Safety and Safeguards, by an appropriate method listed in § 30.6(a) of this chapter, within 30 days of the occurrence of an inability to retract the source assembly to its fully shielded position and secure it in this position.

Title 10 CFR 34.101(b) states that the licensee shall include the following information in each report submitted under paragraph (a) of this section and in each report of overexposure submitted under 10 CFR 20.2203 which involves failure of safety components of radiography equipment: (1) a description of the equipment problem; (2) cause of each incident, if known; (3) name of the manufacturer and model

number of equipment involved in the incident; (4) place, date, and time of the incident; (5) actions taken to establish normal operations; (6) corrective actions taken or planned to prevent recurrence; and (7) qualifications of personnel involved in the incident.

The licensee's failure to submit a written follow-up report containing all required information to Region III within 30 days of the initial report on September 25, 2018, and to the NRC's Offices of Nuclear Material Safety and Safeguards within 30 days of the event on September 23, 2018, is a Severity Level IV violation of 10 CFR 30.50(b)(2) and 10 CFR 34.101(b) in accordance with example 6.9.d.7 of the NRC Enforcement Policy.

The inspector determined that the root cause of the violation was a misunderstanding of regulatory requirements.

As corrective action, on June 12, 2020, the licensee submitted a consolidated written report to the NRC, containing all required information. The Corporate RSO also discussed the requirement with the individual who initially sent the report to the NRC Operations Center.

3.4 NRC Assessment

A. Root Cause of the Event

The inspector determined that the root cause of the event was the failure of the magnetic stand to perform its intended function, and that the lack of a safe line or other method to secure the stand from falling was a contributing factor.

B. Independent Assessment of Radiation Exposure

Using the parameters provided by the current Site RSO for Commerce City, the inspector independently estimated the dose that the radiographer attempting the retrieval received as a result of the incident. The inspector calculated whole-body exposure at eight static and seven variable positions and concluded that the radiographer received just over 11 mrem of dose, which is not statistically significant different from that calculated by the Site RSO, just under 13 mrem. The inspector also determined that the other radiographer received minimal additional exposure from the incident.

C. Assessment of Radiation Safety Practices

The inspector noted that the licensee personnel acted thoughtfully on their knowledge and awareness of the equipment involved and radiological hazards present to pull the source away from the tank wall and to ensure that it rested with the collimator's beam cone facing the floor of the tank. The radiographer who added shielding at the RSO's direction also indicated that he made every effort to avoid the cone of elevated exposure created by the connection between collimator and guide tube while doing so. Both actions demonstrated a commitment to the ALARA principle.

Moreover, based on this demonstrated level of knowledge and awareness of the hazards present, the inspector found that it was reasonable under the circumstances for the Site RSO to remotely direct the crew to add shielding. At a cost of approximately 10 mrem (the remaining mrem was received when the radiographer acted without direction to straighten the guide tube), the available shielding reduced the exposure rate at 50 feet from 8 mrem per hour to 0.7 mrem per hour, well below the limit to members of the public of 2 mrem in any one hour.

Although the situation was resolved unexpectedly quickly, had it lasted longer, the radiographer would have recouped this exposure cost in just over an hour (assuming he maintained surveillance at the entrance of the tank with the shielded source remaining more or less at the center), well before the Site RSO from Commerce City could have reached the job site.

3.5 Conclusions

The inspector noted one Severity Level IV violation of NRC requirements that was revealed through the event. The inspector also identified two other Severity Level IV violations. The licensee corrected all three violations and took actions to address the potential for their recurrence.

4 **Review of Previous Violations**

4.1 Inspection Scope

The inspector evaluated the licensee's implementation of corrective actions for violations cited by the NRC since its last routine inspection through interviews with the licensee's RSO and two Site RSOs, and a review of records.

4.2 Observations and Findings

A. Severity Level IV Violation – August 2019

The inspector confirmed that the licensee had taken corrective action as described in IR 03038913/2019004(DNMS). The inspector reviewed a selection of radiation safety refresher training documentation, identified no additional examples of the violation and determined that the licensee had implemented effective corrective actions to restore compliance and address the potential for recurrence. The violation is closed.

B. Escalated Enforcement Action – March 2020

The inspector confirmed that the licensee had taken corrective actions as described in its written response dated January 8, 2020. The inspector identified no additional examples of the security-related violations and determined that the licensee had implemented effective corrective actions to restore compliance and address the potential for recurrence of each. The violations are closed.

4.3 Conclusions

The inspector closed all open violations.

5 Exit Meeting Summary

The NRC inspector presented preliminary inspection findings following the onsite inspection on January 28, 2021. The licensee did not identify any documents or processes reviewed by the inspector as proprietary. The licensee acknowledged the findings presented.

LIST OF LICENSEE PERSONNEL CONTACTED

Mitchyll Fuller – Site RSO (Indianapolis, IN)
Kevin Hightower – Site RSO (Commerce City, CO)
Bruce Karie – Corporate RSO
Brett Payton – Division Manager (Commerce City, CO)
XXXXXX – Radiographer

Attended exit meeting on January 28, 2021.

INSPECTION PROCEDURES USED

87103 – Inspection of Materials Licensees Involved in an Incident or Bankruptcy Filing
87121 – Industrial Radiography Programs

- END