



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

March 24, 2016

IA-16-025

Mr. Troy Morehead
[NOTE: HOME ADDRESS DELETED
UNDER 10 CFR 2.390]

SUBJECT: INVESTIGATION REPORT 4-2014-043 AND NRC INSPECTION
REPORT 030-38596/2014-001

Dear Mr. Morehead:

This letter refers to the investigation completed on August 17, 2015, by the U.S. Nuclear Regulatory Commission's (NRC's) Office of Investigations at Acuren USA (Acuren). The investigation was conducted to determine whether you, as an employee of Acuren, willfully conducted radiographic operations without maintaining direct visual surveillance of the operation and without the proper postings, in violation of NRC regulations. A factual summary of the investigation as it pertains to your actions is enclosed.

Based on the information acquired during the investigation, an apparent violation of Title 10 of the *Code of Federal Regulations* (10 CFR) 30.10, the NRC's rule on deliberate misconduct has been identified and is being considered for escalated enforcement action in accordance with the NRC's Enforcement Policy. The current Enforcement Policy is included on the NRC's website at www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html.

It appears that you engaged in deliberate misconduct by deliberately failing to perform industrial radiography in compliance with NRC regulations. Specifically, it appears that on April 10, 2014, while performing radiographic operations at the Acuren facility in Kenai, Alaska you deliberately failed to maintain continuous direct visual surveillance of the operation to protect against unauthorized entry into a high radiation area and failed to conspicuously post the area in which industrial radiography was being performed. Your actions may have caused Acuren to be in violation of 10 CFR 34.51 and 10 CFR 34.53. Therefore, the NRC is also considering enforcement action against your employer, Acuren, in part, because of your actions. A copy of the letter issued to Acuren is enclosed.

In addition, based upon your position within the licensee's organization, your level of culpability, lack of actual safety consequences, and your cooperation during the investigation, an Order banning you, in part or in whole, from NRC-licensed activities, or other requirements imposed by an Order, does not appear warranted.

Before the NRC makes its enforcement decision, we are providing you an opportunity to: (1) request a predecisional enforcement conference (PEC), or (2) request alternative dispute resolution. If a predecisional enforcement conference is held, the NRC will issue a meeting notice to announce the time and date of the conference; however, the predecisional

enforcement conference will be closed to public observation since information related to an Office of Investigations report will be discussed and the report has not been made public. A predecisional enforcement conference should be held within 30 days and an alternative dispute resolution session within 45 days of the date of this letter. Please contact Mr. Ray Kellar at 817-200-1191 within 10 days from the date of this letter to notify the NRC of your choice regarding a predecisional enforcement conference or the process of alternate dispute resolution.

If you choose to request a predecisional enforcement conference, the conference will afford you the opportunity to provide your perspective on these matters and any other information that you believe the NRC should take into consideration before making an enforcement decision. The decision to hold a predecisional enforcement conference does not mean that the NRC has determined that a violation has occurred or that enforcement action will be taken. This conference would be conducted to obtain information to assist the NRC in making an enforcement decision. The topics discussed during the conference may include information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned. Following the conference, you will be advised by separate correspondence of the results of our deliberations on this matter.

In lieu of a predecisional enforcement conference, you may also request alternative dispute resolution with the NRC in an attempt to resolve this issue. Alternative dispute resolution is a general term encompassing various techniques for resolving conflicts using a third party neutral. The technique that the NRC has decided to employ is mediation. Mediation is a voluntary, informal process in which a trained neutral (the "mediator") works with parties to help them reach resolution. If the parties agree to use alternative dispute resolution, they select a mutually agreeable neutral mediator who has no stake in the outcome and no power to make decisions.

Mediation gives parties an opportunity to discuss issues, clear up misunderstandings, be creative, find areas of agreement, and reach a final resolution of the issues. Additional information concerning the NRC's program can be obtained at <http://www.nrc.gov/about-nrc/regulatory/enforcement/adr.html>. The Institute on Conflict Resolution at Cornell University has agreed to facilitate the NRC's program as a neutral third party. Please contact Institute on Conflict Resolution at 877-733-9415 within 10 days of the date of this letter if you are interested in pursuing resolution of this issue through alternative dispute resolution.

Because this letter references and encloses information addressing NRC's review of an apparent enforcement action against an individual, this letter and its enclosures will be maintained by the Office of Enforcement in an NRC Privacy Act system of records, NRC-3, "Enforcement Actions Against Individuals." The NRC-3 system notice, which provides detailed information about this system of records, can be accessed from our Web site at <http://www.nrc.gov/reading-rm/foia/privacy-systems.html>, then select [Republication of Systems of Records Notices, September 20, 2010 \(75 FR 57334\)](#).

Since this letter contains specific personal information, this letter will not 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 www.nrc.gov/reading-rm/pdr.html. However, if the NRC concludes that a Notice of

T. Morehead

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Violation is warranted, that final action will be made publicly available and will, therefore, not include specific personal information.

In addition, you should be aware that all final NRC documents, including the final investigation report, are official agency records, and may be made available to the public under the Freedom of Information Act, subject to redaction of certain information in accordance with the Freedom of Information Act.

Sincerely,

/RA/ LLH for

Mark R. Shaffer, Director
Division of Nuclear Materials Safety

Enclosures:

1. Apparent Violation
2. Factual Summary of Office of Investigation Report 4-2014-043
3. Letter to Acuren USA

APPARENT VIOLATION

Troy Morehead
[HOME ADDRESS DELETED
UNDER 10 CFR 2.390]

IA-16-025

Based on the results of an NRC investigation completed on August 17, 2015, an apparent violation of NRC requirements was identified. The apparent violation is listed below:

Title 10 of CFR 30.10(a)(1) states, in part, that an employee of a licensee may not engage in deliberate misconduct that causes a licensee to be in violation of any rule, regulation, or order; or any term, condition, or limitation of any license issued by the Commission.

Title 10 of CFR 34.51 requires that during each radiographic operation, the radiographer, or other individual present, shall maintain continuous direct visual surveillance of the operation to protect against unauthorized entry into a high radiation area.

Title 10 of CFR 34.53 requires that all areas in which industrial radiography is being performed must be conspicuously posted as required by §20.1902(a) and (b) of this chapter.

Contrary to the above, it appears that on April 10, 2014, you, an employee of Acuren USA, engaged in deliberate misconduct that caused this licensee to be in violation of 10 CFR 34.51 and 10 CFR 34.53. Specifically, it appears that you performed industrial radiographic operations without conspicuously posting the area with radiation area and high radiation area signs and without maintaining continuous direct visual surveillance of the operation to protect against unauthorized entry into a high radiation area.

Enclosure 1

FACTUAL SUMMARY
OFFICE OF INVESTIGATION REPORT 4-2014-043

On August 21, 2014, the U.S. Nuclear Regulatory Commission's (NRC's) Office of Investigations Region IV Field Office initiated an investigation to determine, in part, if two radiographers willfully conducted industrial radiographic operations without the proper postings at Acuren USA's field station located in Kenai, Alaska. The investigation was completed on August 17, 2015, and documented in the Office of Investigations' Report 4-2014-043.

On April 10, 2014, at the licensee's Kenai, Alaska field station, inspectors observed that radiographic operations were being performed without conspicuously posting all areas in which industrial radiography was being performed. Specifically, a high radiation area existed outside of the garage in which the radiographers were working. Further, the inspectors observed that the doors to the garage were closed, preventing the radiographers from maintaining direct visual surveillance of the high radiation area outside of the garage, which is necessary to prevent members of the public or other workers from entering the high radiation area.

During the investigation, you acknowledged performing radiography without correcting the inadequate posting of the work area and without maintaining direct visual surveillance of the high radiation area that existed outside of the garage. You also stated that you were aware of the requirement to conspicuously post the restricted area. Specifically, you admitted that you knew that the radiographic operations were being conducted without direct visual surveillance of the entire high radiation area and that you were aware of the requirement to maintain direct visual surveillance of the area. You also said that you saw gaps in the posted boundary just before starting radiographic operations and knew that a complete boundary was required in all areas in which radiography is being performed.

Letter to
Acuren USA



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

March 24, 2016

EA-15-173
EA-14-062

Mr. John Lockwood, President
Acuren USA
43 Arch Street
Greenwich, CT 06830

SUBJECT: NRC INSPECTION REPORT 030-38596/2014-001 AND INVESTIGATION
REPORT 04-2014-043

Dear Mr. Lockwood:

This letter refers to the routine, unannounced inspection of your field station in Kenai, Alaska on April 10, 2014, and a continuation of the inspection at your Anchorage, Alaska field station on April 14, 2014. The purpose of the inspection was to determine whether activities authorized under your license were conducted safely and in accordance with the U.S. Nuclear Regulatory Commission (NRC) requirements. Based on the results of this inspection, the NRC issued a Confirmatory Action Letter (CAL) on April 24, 2014 (ML14114A765). The NRC subsequently conducted a reactive inspection on May 5-8, 2014, at your Anchorage and Kenai field stations in Alaska. Additionally, an investigation by the NRC's Office of Investigations (OI) was initiated on August 21, 2014. The enclosed inspection report documents the results of the routine and reactive inspections conducted at your facilities as described above and the investigation. A telephonic exit briefing was conducted with you on January 28, 2016.

Based on the results of this inspection and investigation, seven apparent violations were identified and are being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The apparent violations involved multiple failures to conduct Acuren USA's radiation safety program in accordance with NRC rules and regulations. In addition, based on OI's investigative results, the NRC is concerned that willfulness may be associated with two of these apparent violations. The circumstances surrounding these apparent violations, the significance of the issues, and the need for lasting and effective corrective actions were discussed with you at the telephonic exit briefing on January 28, 2016.

Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued for these inspection findings at this time. In addition, please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review. Before the NRC makes its enforcement decision, we are providing you an opportunity to either: (1) attend a pre-decisional enforcement conference (PEC), or (2) request alternative dispute resolution (ADR). If a PEC is held, the NRC will issue a meeting notice to announce the time and date of the conference; however, the PEC will be closed to public observation since information related to an Office of Investigations

report will be discussed and the report has not been made public. If you decide to participate in a PEC or pursue ADR, please contact Mr. Ray Kellar at 817-200-1191 within 10 days from the issue date of this letter to notify us of your intentions. A PEC should be held within 30 days and an ADR session within 45 days of the date of this letter.

If you choose to request a PEC, the conference will afford you the opportunity to provide your perspective on these matters and any other information that you believe the NRC should take into consideration before making an enforcement decision. The decision to hold a PEC does not mean that the NRC has determined that a violation has occurred or that enforcement action will be taken. This conference would be conducted to obtain information to assist the NRC in making an enforcement decision. The topics discussed during the conference may include information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your actions would be considered in assessing any civil penalty for the apparent violations. The guidance in the NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful. You can find the Information Notice on the NRC Web site at <http://pbadupws.nrc.gov/docs/ML0612/ML061240509.pdf>.

Following the PEC, you will be advised by separate correspondence of the results of our deliberations on this matter. No response regarding these apparent violations is required at this time.

In lieu of a PEC, you may also request ADR with the NRC in an attempt to resolve this issue. ADR is a general term encompassing various techniques for resolving conflicts using a neutral third party. The technique that the NRC has decided to employ is mediation. Mediation is a voluntary informal process in which a trained neutral (the "mediator") works with parties to help them reach resolution. If the parties agree to use ADR, they select a mutually agreeable neutral mediator who has no stake in the outcome and no power to make decisions. Mediation gives parties an opportunity to discuss issues, clear up misunderstandings, be creative, find areas of agreement, and reach a final resolution of the issues. Additional information about the NRC's program can be obtained at <http://www.nrc.gov/about-nrc/regulatory/enforcement/adr.html>. The Institute on Conflict Resolution (ICR) at Cornell University has agreed to facilitate the NRC's program as a neutral third party. Please contact ICR at 877-733-9415 within 10 days of the date of this letter if you are interested in pursuing resolution of this issue through ADR.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response, if you choose to provide one, 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>.

To the extent possible, your 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 have any questions concerning this matter, please contact Mr. Ray Kellar of my staff at 817-200-1191.

Sincerely,

/RA by LLHowell Acting For/

Mark R. Shaffer, Director
Division of Nuclear Materials Safety

Docket: 030-38596
License: 50-32443-01

Enclosures:

1. NRC Inspection Report 030-38596/2014-001
2. OI Factual Summary 04-2014-043

cc: Alaska Radiation Control Program Director

U.S. NUCLEAR REGULATORY COMMISSION

Region IV

Docket: 030-38596

License: 50-32443-01

Inspection Report: 2014-001

Investigation Report: 4-2014-043

EA: EA-14-062 (CAL)
EA-15-173 (Report)

Licensee: Acuren USA

Facilities: Main Office
600 E. 57th Place, Anchorage, Alaska

Field Station
14896 Kenai Spur Highway, Kenai, Alaska

Date: April 10, 2014 through January 28, 2016

Inspectors: James L. Thompson, Senior Health Physicist (Team Leader)
Nuclear Materials Safety Branch A, Region IV

Roberto J. Torres, Senior Health Physicist
Nuclear Materials Safety Branch B, Region IV

Joseph DeCicco, Senior Health Physicist
Source Management Protection Branch, FSME

Don L. Stearns, Health Physicist
Nuclear Materials Safety Branch A, Region IV

Deborah Piskura, Senior Health Physicist
Materials Inspection Branch, Region III

Approved By: Brooke G. Smith, Acting Chief
Nuclear Materials Safety Branch A

Attachment: Supplemental Inspection Information

EXECUTIVE SUMMARY

Acuren USA
NRC Inspection Report 030-38596/2014-001

This was an announced, reactive inspection initiated in response to the preliminary findings of an unannounced inspection performed on April 10, 2014. The April 10th inspection identified industrial radiographic operations being conducted in relatively close proximity to members of the public without having the radiation area posted or being physically observed by the radiography crew. The reactive inspection was then initiated on May 5, 2014, to determine if any member of the public could have potentially received radiation exposures in excess of regulatory limits. This report includes the details of the April 10th inspection and the findings of the subsequent reactive inspection.

Program Overview

Acuren USA is authorized to conduct industrial radiography under NRC License 50-32443-01 at a field station in Alaska, at temporary job sites throughout the United States, and in territorial Federal waters where NRC maintains jurisdiction for regulating the use of licensed material. (Section 1)

Radiation Dose Assessment

The licensee demonstrated, through calculations and interviews with personnel at both the Kenai and Anchorage field stations, that no member of the public actually received a radiation dose in excess of regulatory limits. These calculations were based on information from the exposure logs recorded by the licensee for past radiography operations. The NRC independently verified this assessment through a reenactment of the circumstances discovered during the April 10th inspection and review of information developed during interviews with personnel occupying the same business complex as Acuren USA in Kenai, Alaska. The NRC did determine, however, that a substantial potential existed for members of the public to have received radiation doses in excess of regulatory limits at the Kenai, Alaska field station on April 10, 2014. (Section 5)

Inspection Findings

The NRC inspection team identified numerous violations of regulatory requirements, including failures to:

- Keep the restricted area under constant surveillance while conducting industrial radiography;
- Conspicuously post all areas in which industrial radiography was being performed;
- Conduct an inspection program of the job performance of each radiographer and radiographer's assistant every six months;
- Periodically (at least annually) review the radiation protection program content and implementation;
- Provide annual radiation safety training for radiographers and radiographer assistants;

- Show compliance with the annual dose limits to individual members of the public during the conduct of industrial radiography. (Section 7.2)

Corrective Actions

Both short and long-term corrective actions were taken by the licensee, including:

- Development of a lessons-learned document summarizing the April 10, 2014, event to include a causal analysis;
- The licensee-provided refresher training to all radiography personnel;
- The licensee's Director of Radiation Safety, with support from other Acuren Radiation Safety Officers, conducted a thorough radiation safety audit of licensed activities;
- The licensee's Director of Radiation Safety conducted multiple unannounced radiation safety field audits of Kenai crews working at temporary job sites;
- The licensee will conduct future radiographic operations at the Kenai, Alaska, field station only in an isolated area at the back of the property and not in the garage;
- The licensee will conduct a walk down of the immediate and surrounding areas prior to conducting radiographic operations at the Kenai field office location;
- The licensee will inform building tenants working adjacent to or in the vicinity of the Kenai field office and will place postings identifying times and locations of radiographic operations. (Section 8)

Report Details

1 Program Overview (87121)

1.1 Program Scope

Acuren USA is authorized under NRC License 50-32443-01 to possess and use byproduct material to perform industrial radiographic operations at locations specified on the license, at temporary job sites in the United States, and in territorial Federal waters where NRC maintains jurisdiction for regulating the use of licensed material. At the time of the April 10, 2014, inspection at the Kenai field station, the licensee was conducting industrial radiographic operations in relatively close proximity to members of the public without having the radiation area posted or being physically observed by the radiography crew.

1.2 Observations and Findings

On April 10, 2014, inspectors conducted an unannounced, routine inspection at Acuren USA's field station in Kenai, Alaska. Several apparent violations of NRC requirements were immediately identified including the failures to post radiation areas and to directly observe the restricted area during radiographic operations. NRC inspectors then visited Acuren USA's other field station in Anchorage, Alaska on April 14, 2014, to gather additional information regarding licensed activities. A Confirmatory Action Letter was issued on April 24, 2014, which documented the actions that the licensee agreed to take, which included the suspension of radiography activities at the Kenai, Alaska field station. NRC Region IV initiated a reactive inspection on May 5, 2014, to obtain further information regarding these apparent violations. The inspectors reviewed the NRC license, records maintained by the licensee, and interviewed licensee personnel as well as members of the public.

2 April 10, 2014 Event and Inspection Overview (87121)

On the morning of April 10, 2014, at approximately 10:30 a.m., a customer dropped off a piece of piping assembly at the Kenai, Alaska field station of Acuren USA to be radiographed. At around 11:00 a.m., this assembly was taken into the garage for setup. At around 1:15 p.m., one of the radiographers set warning cones at a doorway into the garage labeled "Caution- Radiation Area"; at 1:30 p.m., the other radiographer checked out the exposure device from the storage vault and assembled the exposure device and associated equipment in the garage. Radiographic operations began shortly thereafter.

At approximately 2:20 p.m., NRC inspectors arrived at the Acuren USA field office located at 14896 Kenai Spur Highway, Kenai, Alaska to perform a routine unannounced inspection. The field station is located in a small industrial park and the licensee's office space is located in a building with four additional companies. The inspectors noted a doorway leading from the Acuren USA office to another building immediately to the north. The inspectors noticed red warning cones with the Caution, Radiation Area labels along the sidewalk between the two buildings. No other warning cones or barriers were visible.

Using a survey meter, RadEye B20, Serial Number 12398, calibration due August 26, 2014, the inspectors proceeded through a vehicle access gate and along the west side of the two buildings without encountering any licensee employees or restricted

area boundaries. As the inspectors approached the northwest corner of the garage, the survey meter suddenly read off-scale (greater than 200 mR/hour). The inspectors determined that radiography was being performed inside the shop building, so they backed away from the building to reduce their radiation exposure. At a distance of about 40 feet from the building, their survey meter displayed a reading of about 200 mR/hour. After approximately 2 minutes, the survey meter reading returned to background, indicating that the radiography exposure was complete.

As the inspectors approached the entrance to the shop building, one of the licensee crew members exited the shop building and retrieved the warning cones that were placed near the sidewalk between the two buildings. The inspectors introduced themselves and entered the shop building by the south walk-in door. The radiography truck with attached darkroom was parked in an east-west orientation at the south end of the shop. The radiography camera crankout assembly was on the ground just to the northwest end of the truck. The camera had already been secured and the guide tube was lying on the ground extended to the northeast corner of the shop where the pipe assembly was positioned.

The two radiographers were questioned about the radiography operations and the lack of barrier cones outside the building. The radiographers informed the inspectors that they had placed the cones at the personnel door on the south end of the building, were redirected to another task, and forgot to go back and post the perimeter of the building with the appropriate warning signs and barrier tape. Additionally, since the garage doors were shut during radiographic operations, the crew could not maintain visual surveillance of the area outside of the garage.

The inspectors verified the radiographers were properly using the required dosimetry and personal protection equipment. The inspectors performed additional inspection activities including a detailed records review. The inspectors asked about a public dose assessment for storage of the radiography devices, and the local radiation safety officer (RSO) could not locate one. The inspection at the Kenai field office was completed at approximately 5:00 p.m.

On April 14, 2014, at approximately 7:25 a.m., the inspector arrived at the Acuren USA field office at 600 E. 57th Place, Anchorage, Alaska. The Acuren USA Division Manager was the primary contact during the inspection of the Anchorage facility. The inspector reviewed documentation for licensed activities at the Anchorage field office, to include a public dose assessment; again, this documentation could not be located. Also, an annual audit of the radiation protection program for 2013 was not available. The inspection was completed at approximately 11:00 a.m.

3 Confirmatory Action Letter Issuance and Licensee Response

In response to the inspectors' observations on April 10, 2014, the NRC issued a Confirmatory Action Letter (CAL) to Acuren USA on April 24, 2014 (ML14114A765). This CAL documented certain activities agreed upon between Acuren USA and the NRC during a telephone call on April 14, 2014, and Acuren USA's commitment to complete the actions by May 14, 2014. These activities included, but were not limited to: the suspension of all radiographic operations at the Kenai, Alaska field office; the submittal of calculations and evaluations of radiation levels that likely existed during past radiographic operations at both the Kenai and Anchorage, Alaska field offices; and

submitting to NRC a copy of any other evaluations performed for other temporary job sites.

Acuren USA responded to the CAL by letter dated May 14, 2014. In this reply, Acuren USA described the actions that they had taken in response to the CAL. This response was reviewed by the inspection team and several deficiencies were noted and transmitted to the licensee in an acknowledgement letter dated May 30, 2014 (ML14150A512). The deficiencies identified by the inspection team in Acuren USA's May 14, 2014 response included: the lack of information describing the retraining provided to radiographers, assistant radiographers, and managers since the April 10, 2014 event; the inaccuracy of the facility layout at the Kenai, Alaska field office; and discrepancies in the calculations of potential doses to members of the public at both the Anchorage and Kenai field offices.

Acuren USA responded in a letter dated June 13, 2014 (ML14167A185) with their supplemental response to the CAL. This supplemental response included revised calculations for potential radiation doses to members of the public at both field stations, as well as a description of how future radiographic operations would be performed at both the Anchorage and Kenai field stations. The inspection team again identified discrepancies in the public dose calculations for both field stations. Some of the discrepancies included the erroneous calculation of potential public dose at 50 feet from the source (approximate location of business offices) and the failure to include the potential for radiation doses to members of the public that had access to a high radiation area around the external walls of the shop in which radiographic operations were being performed at the Kenai field station on April 10, 2014 (only potential doses at 50 feet were provided). Additionally, the calculations for public dose at the Anchorage field station could not be replicated by the inspection team.

On July 14, 2014, an electronic mail was sent to Acuren USA's RSO, requesting that the calculations be revised for both field stations as described above, as well as additional information, such as Acuren USA's root cause analysis. This email was replied to by Acuren USA's RSO on August 1, 2014 (ML15292A570). The corrected calculations submitted in this email were determined to be adequate by the inspection team to meet the conditions of the CAL. A letter was sent to the licensee on August 22, 2014 (ML14237A065), which acknowledged the receipt of the requested information and closed the CAL.

4 Licensee's Causal Evaluation of Event and NRC Review

4.1 Acuren USA Causal Evaluation

The licensee developed an eight-discipline (8D) report to address the potential causes of the April 10th event on May 13, 2014, and subsequently modified it on December 19, 2014. On January 8, 2015, Acuren USA provided the final version of the 8D report to the NRC.

In this report, the licensee documented a "Root Cause Summary" that listed the following items as root causes:

- Technicians made an incorrect assumption that they had full control of the radiation area based on their line of sight on all interior garage entrances and exits;

- There was no further control over the operation beyond the two technicians themselves and due to inadequate and incomplete communication between them, they failed to understand that the full 360 degrees of the barrier or the 2 millirem/hour perimeter were not fully erected and controlled; and
- Radiographers failed to follow all prescribed steps detailed in the Acuren USA operations manual. Specifically they failed to complete a survey of the boundary perimeter and enter actual values for millirem/hour on the Daily Radiation/Utilization Report.

4.2 NRC Review of Licensee's Causal Evaluation

Although the inspection team agreed that the causes listed above contributed to the event, the inspection team did not agree that these were root causes of the event. The team determined that there were several factors that contributed to the April 10, 2014, event, including the following:

- Failure of the radiographers to physically observe the restricted area;
- Failure of the radiographers to ensure that barricades were appropriately placed at the boundary where members of the public could have received greater than two millirem in any one hour;
- Failure of the licensee to perform field audits of each radiographer and radiographer's assistant at six-month intervals, to ensure that the above failures had not taken place; and
- Failure of the licensee to provide annual refresher radiation safety training to all radiographers and radiographer's assistants.

The team determined that the root cause for the April 10, 2014, event was the lack of appropriate management oversight of the Kenai, Alaska field station and its employees with regard to the radiation safety program. Licensee staff stated during interviews that the RSO was rarely present at the Kenai field station and that he relied on the local employees (described as Site RSOs) to provide this oversight; however, the Site RSOs stated that they did not have time to adequately oversee the radiation safety program at the licensee's Kenai, Alaska field station. Further, licensee management failed to ensure that all of the radiographers and radiographer's assistants received the required training and field audits, which could have identified poor work practices and led to corrective actions that may have precluded the failures observed on April 10, 2014.

5 Radiation Dose Assessment Based on Reenactment of April 10th Event

5.1 Introduction

The licensee determined through calculations and interviews with personnel at both the Kenai and Anchorage field stations that no member of the public received a radiation dose in excess of regulatory limits. These calculations were based on information from the exposure logs recorded by licensee staff for past radiography operations. The NRC independently verified this through a reenactment of the circumstances discovered during the April 10, 2014, inspection at the Kenai, Alaska field station, in addition to

interviews with personnel occupying the same business complex as Acuren USA in Kenai, Alaska (considered members of the public). The NRC did determine, however, that a substantial potential existed for members of the public to receive radiation doses in excess of regulatory limits at the Kenai, Alaska field station on April 10, 2014, around the garage in which radiography was being performed.

5.2 Kenai Field Station Data

For the Kenai site, the licensee performed exposure rate measurements on May 6, 2014, under the observation of NRC inspectors, to gather information on exposure rates in the surrounding areas that would exist under conditions similar to the operations conducted on April 10, 2014. The licensee used a 73.4 Curie Iridium-192 radiography source for this reenactment and performed dose rate measurements at several locations and different distances from the exposed source, which was located inside of the garage.

A table of radiography exposures provided in a set of Kenai work documents provided by the licensee contained work dates of radiographic operations performed at Kenai from April 18, 2013 to April 10, 2014. Thirty radiographic operations occurred in 2013, and thirteen occurred in 2014. This table also contained the reenactment empirical measurement data (actual measured exposure rates) recorded on May 6, 2014, at a 50-foot distance in the south direction from the source (which was the location of the closest office which a member of the public could have occupied). Using the empirical exposure rate at 50 feet, the licensee estimated area exposures for operations that occurred on other dates at the same location. The calculated exposure rates for the operational dates during 2013 and 2014 were adjusted for the different activities of sources used and for the duration of each exposure for each date.

The calculations for each day of radiographic operations at the Kenai field station indicate that the total exposures at the location 50 feet south of the source were low, with only two of the 43 operational calculations above 2 milliroentgens (2.1 and 3.0). In considering the possible public annual exposure, the calculated exposures at the south 50 foot location summed to less than 100 milliroentgen per year for calendar years 2013 and 2014 (as of April 10, 2014).

Other distances and locations around the garage (laydown area) had various exposure rates measured during the reenactment on May 6, 2014. The exposures rates to the west, north and east included the effect of the radiography apparatus collimator shielding and differences in distances. To the west of the source location, a dose rate of 4 millirem/hour was measured at 84 feet from the source. To the north, a dose rate of 3 millirem/hour was measured at 126 feet from the source. To the east, a dose rate of 23 millirem/hour was measured at 126 feet from the source, which was the highest dose rate measured during this reenactment. After correction for the 94 curie source that was actually used during the April 10th event, and correcting for the actual distances from the source to the external wall of the garage in each direction, these dose rates were 58 millirem/hour, 613 millirem/hour, and 2,090 millirem/hour, respectively. Then accounting for the 12-minute total exposure time, the radiation doses at the exterior walls of the garage in which the radiography was being performed on April 10th would have been approximately 12 millirem on the west side, 122 millirem on the north side, and 419 millirem on the east side.

Although it does not appear that any member of the public was present near this garage during the radiographic operations on April 10th, the potential existed for a member of the public, had they been near the north and east sides of the garage during the 12 minutes of total exposure time (6 exposures at 2 minutes each), to have easily exceeded the annual limit on radiation exposure for members of the public, which is 100 millirem.

5.3 Anchorage Field Station Data

The information below is based on gamma-ray factors and calculations for the different radiography sources available and used at the Anchorage site. There was no empirical data provided because a reenactment was not performed at the Anchorage location.

The table of exposure rates and exposures in the set of the Anchorage site documents submitted by the licensee contained work dates of operations performed at Anchorage, or at temporary job sites, that spanned from 12/08/2013 to 05/04/2014. Five operational dates occurred in 2013 and eleven in 2014. The calculated exposure rates for the operational dates during 2013 and 2014 were adjusted for the different activities of different sources used, for the different radionuclides used, for the shielding assumed to be 4 half value layers, and for the duration (in minutes) of operational exposures for each date as detailed on the daily radiation reports.

The calculation for each listed operational day at Anchorage contained the radionuclide used, the activity of the source, and the total exposure time in minutes. The gamma-ray factors used for calculations are 0.483, 0.315, and 0.204 R-m²/(Ci-hr) for iridium-192, cesium-137, and selenium-75, respectively. The data table contained exposure calculations for each day's total exposure times at the locations 30, 45, 67 and 75 feet from the source operational location. The report indicated that 30 feet is the closest distance to the fence as one looks out the back of the shop, which would be the closest to the radiography camera/source to which any member of the public could have had access.

With the radionuclide of the source, the source curie activity, and total exposure time listed in the data table provided for the Anchorage site, the exposures listed at any of the distances could not be duplicated by the team. The exposures calculated by the licensee at 30 feet were lower than those derived by the team; however, the team evaluation indicated that 11 exposures of the 16 exposures on the dates indicated were only 2 milliroentgens at the 30 feet distance.

In considering the possible annual public dose for the Anchorage field station, the inspection team concluded that the calculated radiation doses at the 30 feet distance summed to less than 100 millirem in both years 2013, and 2014 (as of May 4, 2014).

5.4 Conclusions Regarding Radiation Dose Assessment

The NRC concluded, through independent measurements and calculations from the May 6, 2014, reenactment, that no member of the public actually received a dose greater than 2 millirem in any one hour, or 100 millirem in Calendar Years 2013 or 2014, due to the radiographic operations of Acuren USA at either their Anchorage or Kenai, Alaska field stations. The NRC did conclude, however, that a substantial potential did exist for members of the public to have exceeded these limits at the Kenai, Alaska field station during the radiographic operations on April 10, 2014.

6 Oversight of the Radiation Safety Program

6.1 Inspection Scope

The inspectors reviewed the licensee's organization and management controls for the radiation protection program, including program audits and audits of the performance for radiographers and radiographer's assistants. Additionally, the inspectors reviewed aspects of the licensee's program for controlling and monitoring radiation dose from external sources and performed a review of their training program. The reviews included discussions with selected members of licensee staff, tours of the licensee's field offices, and observations of radiographic operations.

6.2 Observations and Findings

6.2.1 License and Audits

License Condition 13 named a specific individual as the RSO for the radiographic operations conducted under the license. The individual designated as the RSO was directly responsible for the daily implementation and oversight of the radiation safety program at the licensee's Prudhoe Bay, Anchorage, and Kenai, Alaska facilities. According to the licensee staff, this RSO worked mainly on the North Slope and was not present the majority of the time at either Anchorage or Kenai field offices. In February 2014, the individual designated as RSO resigned from Acuren USA, and a license amendment request to remove him as RSO from the license was submitted to the NRC on April 3, 2014.

The inspectors reviewed reports documenting the licensee's review of its radiation safety program. The reports demonstrated that the licensee had not experienced any off-scale dosimeters, overexposures, equipment failures, or source disconnects; however, the inspectors identified that annual reviews of the radiation protection program were not performed between February 2012 and May 2014.

A review of the licensee's audit forms documenting the observation and performance of four radiographers based at the Kenai office revealed that these audits were not performed at the required six month intervals. Specifically, the licensee failed to conduct an audit of the job performance of the following radiographers during the following time periods: Radiographer 1, from May 8, 2012 through May 4, 2014; Radiographer 2, from June 6, 2013 through April 11, 2014; Radiographer 3, from June 27, 2013 through February 28, 2014; and Radiographer 4, from March 31, 2012 through April 11, 2014.

6.2.2 Qualifications, Training and Instructions to Workers

The inspectors determined that all radiography personnel were certified in industrial radiography through a recognized radiographer certification program. The licensee maintained copies of each radiographer's wallet card in the individual's training file. The inspectors interviewed several radiographers and these individuals demonstrated their knowledge in the operating and emergency procedures. The licensee provided in-house training to its radiographer's assistants.

The inspectors' review of training records identified that two radiographers had not received annual refresher safety training for Calendar Year 2013. In addition, between

2010 and 2014, two individuals based in the Kenai field office did not receive U.S. Department of Transportation hazardous materials training at the required three-year interval.

6.3 Conclusions

The inspection team identified multiple apparent violations of NRC requirements that directly involved the management oversight of Acuren USA's radiation safety program. As previously stated, Acuren USA's RSO was rarely present at the Kenai field station, and the local RSOs stated that they did not have the time necessary to ensure that licensed operations were performed in accordance with regulatory requirements. These apparent violations are included in the Inspection Findings Summary in Section 7 of this report.

7 **Inspection Findings Summary (87121)**

7.1 Inspection Scope

The inspectors reviewed Acuren USA's NRC license and documentation related to the radiographic operations performed at the licensee's Anchorage and Kenai, Alaska facilities. The inspectors also reviewed Acuren USA's operating procedures for the performance of industrial radiography, as well as records associated with the radiation safety program oversight.

Additionally, the inspectors interviewed licensee staff, including the radiographers, assistant radiographers, local management at each facility, as well as corporate management. Further, the inspectors observed Acuren USA's reenactment of the radiographic operation that was initially observed by the inspectors during the onsite inspection on April 10, 2014.

7.2 Summary of Observations and Findings

There were seven apparent violations identified during the routine and reactive inspection, as described below:

- License Condition 19.A states, in part, that the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the application dated November 24, 2012. Section 6.1.1 of the licensee's Operating and Emergency Procedures, which were submitted as part of the license application described above, states that a Restricted Area is any area utilized for the purpose of performing industrial radiography [which] must have access controlled when the radiation levels in the area exceed 2 millirem in any one hour. Section 6.1.2 states, in part, that radiographers and assistant radiographers shall control Radiation Restricted Areas at all times. Section 6.1.2 also states that "the radiographer and assistant radiographers must keep the perimeters under constant surveillance during the exposure.... An exposure is never to be made without the Radiation Restricted Area clearly established and posted with radiation area sign(s)."

Further, 10 CFR 34.51 requires that during each radiographic operation, the radiographer, or other individual present, shall maintain continuous direct visual surveillance of the operation to protect against unauthorized entry into a high radiation area.

On April 10, 2014, the licensee failed to keep the perimeter of the Radiation Restricted Area, and the high radiation area that existed outside of the shop, under constant surveillance during the radiographic exposures. Exposures were made inside of the shop without clearly establishing the Radiation Restricted Area and posting that area with radiation area signs, as well as high radiation area signs, outside of the shop, as described in Section 2 of this report.

The failure to keep the perimeter of the Radiation Restricted Area under constant surveillance, and clearly establishing this area with proper signage, during the radiographic exposures on April 10, 2014, was identified as an apparent violation of Condition 19.A. of NRC License 50-32443-01, and 10 CFR 34.51.
(030-38596/14001-01)

- 10 CFR 34.53 requires that all areas in which industrial radiography is being performed must be conspicuously posted as required by §20.1902(a) and (b) of this chapter.

On April 10, 2014, the licensee did not conspicuously post both a radiation area and high radiation area around the shop building at 14896 Kenai Spur Highway, Kenai, Alaska, where industrial radiography was being performed. As described previously in this report, potential doses on the exterior walls of the garage exceeded 100 millirem during the hour in which they were exposing the source requiring that both radiation area and high radiation area signs be conspicuously posted in these areas.

The failure to conspicuously post all areas in which industrial radiography is being performed was identified as an apparent violation of 10 CFR 34.53.
(030-38596/14001-02)

- 10 CFR 34.43(e) states, in part, that the RSO or designee shall conduct an inspection program of the job performance of each radiographer and radiographer's assistant to ensure that the Commission's regulations, license requirements, and the applicant's operating and emergency procedures are followed. The inspection program must include the observation of the performance of each radiographer and radiographer's assistant during an actual industrial radiographic operation, at intervals not to exceed six months.

At the time of the inspection beginning on April 10, 2014, the licensee had failed to conduct an inspection program of the job performance of four radiographers and radiographer's assistants at various intervals between CY 2012 and CY 2014, which is described in detail in Section 6 of this report.

The failure to conduct an inspection program of the job performance of each radiographer and radiographer's assistant to ensure that the Commission's regulations, license requirements, and the applicant's operating and emergency procedures were followed was identified as an apparent violation of 10 CFR 34.43(e).
(030-38596/14001-03)

- 10 CFR 20.1101(c) requires that the licensee shall periodically (at least annually) review the radiation protection program content and implementation.

The licensee failed to perform a periodic (at least annual) review of the radiation protection program content and implementation between CY 2012 and 2014 which is described in detail in Section 6 of this report.

The failure to periodically (at least annually) review the radiation protection program content and implementation was identified as an apparent violation of 10 CFR 20.1101(c). (030-38596/14001-04)

- 10 CFR 20.1302(b) states, in part, that a licensee shall show compliance with the annual dose limit in 10 CFR 20.1301 by demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose does not exceed the annual dose limit.

As of April 10, 2014, the licensee had failed to demonstrate by measurement or calculation that the total effective dose equivalent to the individual member of the public likely to receive the highest dose did not exceed the annual dose limit in 10 CFR 20.1301. The inspectors identified that the licensee had failed to perform and document these measurements or calculations for the locations at both the Anchorage and Kenai field stations where radiographic operations were being performed and radiography devices were being stored.

The failure to show compliance with the annual dose limit in §20.1301 by demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose does not exceed the annual dose limit was identified as an apparent violation of 10 CFR 20.1302(b). (030-38596/14001-05)

- 10 CFR 34.43(d) requires, in part, that the licensee shall provide annual refresher safety training for each radiographer and radiographer's assistant at intervals not to exceed 12 months.

During a review of these training documents, it was determined that the licensee failed to provide annual refresher safety training to two radiographers between December 2012 and April 2014, an interval in excess of 12 months. This violation is described further in Section 6 of this report.

The licensee's failure to provide annual refresher safety training to two radiographers between December 2012 and April 2014, an interval in excess of 12 months, is an apparent violation of 10 CFR 34.43(d). (030-38596/14001-06)

- 10 CFR 71.5(a) requires, in part, that each licensee who transports licensed material (hazardous material) on public highways shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR Parts 107, 171-180, and 390-397.

49 CFR 172.704(c) requires, in part, that a hazmat employee receive initial training, and recurrent training at least once every three years.

The inspectors review of the licensee's training records for radiography personnel at the Kenai office revealed that two radiographers had not received recurrent hazmat training at least once every three years. This violation is described further in Section 6 of this report.

The licensee's failure to provide recurrent training every three years for its hazmat employees who transported hazardous material was identified as an apparent violation of 10 CFR 71.5(a). (030-38596/14001-07)

7.3 Conclusions

The NRC identified seven apparent violations of NRC requirements during this inspection, as described in Section 7.2.

8 **Corrective Actions (87121)**

8.1 Immediate Corrective Actions Taken By Acuren USA

- The licensee developed a lessons learned document summarizing the April 10, 2014, event that occurred at the Kenai field office and shared it with all radiographic personnel.
- Following the April 10, 2014, event the licensee provided refresher training to all radiographic personnel. The training included a review of all requirements associated with the conduct of radiographic operations with special emphasis on constant surveillance and placement of radiation barrier requirements.
- The licensee's Director of Radiation Safety, with support from other Acuren RSOs, conducted a thorough radiation safety audit of licensed activities authorized under NRC license 50-32443-01. Deficiencies that were identified have been corrected, and corrective actions are being monitored to ensure regulatory compliance.
- The licensee's Director of Radiation Safety conducted two unannounced radiation safety field audits of Kenai crews working at temporary job sites. No deficiencies were identified.
- As a result of the April 10, 2014, event the licensee has developed a "Golden Rules" policy that summarized specific radiation safety requirements which radiographic personnel must follow. All licensee radiographic personnel have been trained on this policy. The training included an examination that requires a 100 percent passing score, and any failures require retraining and reexamination. All of the licensee's 1,011 radiography personnel have passed the examination.
- The licensee has named a new RSO to provide oversight of the day-to-day operations within Acuren USA, Inc. The new RSO was approved with the issuance of amendment number 02 dated July 10, 2014, to NRC license 50-32443-01.

8.2 Long-Term Corrective Actions Taken By Acuren USA

- The licensee will conduct future radiographic operations at the Kenai, Alaska field station only in the laydown (isolated) area, a distance away from the licensee's indoor garage area. Licensed operations will not be conducted at any time in the garage.
- The licensee's proposed action of closing and locking the main gate to the laydown area is not an effective means of access control because the gate is not part of the Acuren's facility, the gate is under control of the Kenai Peninsula Economic Development District. The licensee can claim positive access control, and the NRC will accept it, if Kenai Peninsula Economic Development District agrees in writing to relinquish gate control to the licensee when conducting radiographic operations. Otherwise, the licensee cannot claim that they have positive access control of the gate when someone other than

Acuren can open the gate and enter the laydown area. In addition, the licensee cannot claim an effective access control of the gate when members of the public inside the building can still have access to the laydown area from different access points within the building. The licensee can still maintain an effective access control of the area where radiographic operations will be conducted (laydown area) without the need of controlling the gate, if the next two bullet items are maintained.

- The licensee will use physical barriers to identify radiation areas and high radiation areas when conducting radiography in the laydown area, in accordance with 10 CFR Part 34, "Licenses for industrial radiography and radiation safety requirements for industrial radiographic operations."
- The licensee will conduct a walk down of the immediate and surrounding areas prior to conducting radiographic operations and will maintain constant surveillance of the camera and area at all times to ensure that no individual member of the public enters the area when radiographic operations are conducted.
- The licensee performed and documented ambient radiation level surveys to ensure members of the public will not receive more than 2 millirem in any one hour, or 100 millirem in a year, in accordance with 10 CFR 20.1301, "Dose limits for individual members of the public."
- The licensee will inform building tenants in the vicinity of the Kenai field station when radiographic operations will be conducted, to include posting of information identifying times, locations of radiographic operations, and licensee's contact information.
- The licensee's Director of Radiation Safety will observe, evaluate, and train personnel during the initial implementation of the Kenai field office revised procedures.

8.3 Conclusions

Acuren USA has implemented or proposed to implement both immediate and long-term corrective actions that should provide reasonable assurance that similar conditions that existed during the April 10, 2014, inspection will not exist in the future.

9 **Exit Meeting Summary**

A preliminary exit briefing was conducted at the conclusion of the on-site portion of the team inspection on May 7, 2014. A final telephonic exit briefing was performed on January 28, 2016. Licensee representatives acknowledged the special inspection team's findings. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

John Lockwood, President, Rockwood Services Corporation
Frank Noble, Director of Operations, Acuren Alaska
Dennis Lee, General Manager, Acuren Alaska
Chris Dixon, Radiation Safety Director, Acuren Inspection, Inc.

INSPECTION PROCEDURES USED

87121 Industrial Radiography Programs

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

030-38596/14001-01	APV	Apparent violation involving the failure to maintain direct surveillance over radiographic operations
030-38596/14001-02	APV	Apparent violation involving the failure to conspicuously post all areas in which industrial radiography is being performed
030-38596/14001-03	APV	Apparent violation involving the failure to conduct field audits of radiographers and assistants
030-38596/14001-04	APV	Apparent violation involving the failure to review radiation protection program annually
030-38596/14001-05	APV	Apparent violation involving the failure to show compliance with the annual dose limit in 10 CFR 20.1301
030-38596/14001-06	APV	Apparent violation involving the failure to provide annual refresher safety training to five radiographers
030-38596/14001-07	APV	Apparent violation involving the failure to provide recurrent hazmat training to employees transporting hazardous material on public highways

Closed

None

Discussed

None

LIST OF ACRONYMS USED

APV	Apparent Violation
CFR	<i>Code of Federal Regulations</i>
CY	Calendar Year
DOT	Department of Transportation
EA	Enforcement Action
NRC	Nuclear Regulatory Commission
RSO	Radiation Safety Officer

FACTUAL SUMMARY OF NRC INVESTIGATION

On August 21, 2014, the U.S. Nuclear Regulatory Commission's (NRC) Office of Investigations (OI) Region IV Field Office initiated an investigation to determine if two radiographers willfully conducted industrial radiographic operations without the proper postings and monitoring, and whether an Operations Director willfully provided incomplete and inaccurate information regarding the aforementioned operations at Acuren USA's field station located in Kenai, Alaska. The investigation was completed on August 17, 2015, and documented in OI Report 04-2014-043.

On April 10, 2014, at the licensee's Kenai, Alaska field station, inspectors observed that radiographic operations were being performed without conspicuously posting all areas in which industrial radiography was being performed. Specifically, a high radiation area that existed outside of the garage in which the radiographers were working. Further, the inspectors observed that the doors to the garage were closed, preventing the radiographers from being able to directly observe the high radiation area outside of the garage, which is necessary to prevent members of the public or other workers from entering the high radiation area.

During the investigation, the radiographers acknowledged performing radiography without properly posting the work area and without observing the high radiation area that existed outside of the garage. The radiographers stated that they were aware of the requirements to conspicuously post the restricted area, and that they were aware of the requirement to maintain direct visual surveillance of the radiography operation.