



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

May 19, 2014

EA-14-060

Mr. James Sherer, President
Patriot Engineering and Environmental, Inc.
6330 E. 75th Street, Suite 216
Indianapolis, Indiana 46250

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 03037878/2014001(DNMS) –
PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

Dear Mr. Sherer:

On March 27 and 28, 2014, with continued in-office review through April 21, 2014, the U.S. Nuclear Regulatory Commission (NRC) conducted a routine inspection of your facilities located in Indianapolis, Fort Wayne, and Lafayette, Indiana. The purpose of the inspection was to determine whether activities authorized under your license were conducted safely and in accordance with NRC requirements. The enclosed report presents the results of this inspection. A final exit meeting was held between Mr. Andrew Bramnik of my staff and Mr. John Phillips of your staff by telephone on April 21, 2014.

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 selected examination of procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of this inspection, one apparent violation was identified and is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The apparent violation involved the failure to secure portable gauges from unauthorized removal with a minimum of two independent physical controls, as required by License Condition 17 of your NRC License No. 13-32725-01, which reiterated the requirement in Title 10 of the *Code of Federal Regulations* (CFR) Section 30.34(i).

Because the NRC has not made a final determination in this matter, the NRC is not issuing a Notice of Violation for this matter at this time. The circumstances surrounding this apparent violation, the significance of the issue, and the need for lasting and effective corrective action were discussed with Mr. John Phillips at the inspection exit meeting on April 21, 2014.

Before the NRC makes its enforcement decision, we are providing you an opportunity to either: (1) respond in writing to the apparent violation addressed in this inspection report within 30 days of the date of this letter, or (2) request a Predecisional Enforcement Conference (PEC). If a PEC is held, it will be open for public observation, and the NRC will issue a press release to announce the time and date of the conference. **Please contact Aaron T. McCraw at 630-829-9650 within ten days of the date of this letter to notify the NRC of your intended response.**

If you choose to provide a written response, it should be clearly marked as "Response to the Apparent Violation in Inspection Report No. 03037878/2014001(DNMS); EA-14-060," and should include, for the apparent violation: (1) the reason for the apparent violation, or, if contested, the basis for disputing the apparent violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken to avoid further violations; and (4) the date when full compliance will be achieved. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your actions will be considered in assessing any civil penalty for the apparent violation. The guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful in preparing your response. You can find the information notice on the NRC's website at: <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1996/in96028.html>. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision or schedule a PEC.

If you choose to request a PEC, the conference will afford you the opportunity to provide your perspective on the apparent violation and any other information that you believe the NRC should take into consideration before making an enforcement decision. The topics discussed during the PEC may include the following: 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 to be taken.

Because your facility has not been the subject of escalated enforcement actions within the last two years or two inspections, a civil penalty may not be warranted in accordance with Section 2.3.4 of the Enforcement Policy. In addition, based upon the NRC's understanding of the facts and your corrective actions, it may not be necessary to conduct a PEC in order to enable the NRC to make a final enforcement decision. Our final decision will be based on your confirming on the license docket that corrective actions have been or are being taken.

Please be advised that the number and characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results of our deliberations on this matter.

In addition, based on the results of this inspection, the NRC has also determined that seven Severity Level IV violations of NRC requirements occurred. Three violations involving transporting radioactive materials have been grouped into a Severity Level IV problem. The violations were evaluated in accordance with the NRC Enforcement Policy. The violations

concerned the licensee's failure to: (1) apply for and receive a license amendment before changing a permanent storage location in January 2010, as required by 10 CFR 30.34(c); (2) conduct a physical inventory of all sealed sources and devices possessed under the license every six months, as required by Condition 15 of NRC License No. 13-32725-01; (3) test sealed sources for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration, as required by Condition 13.A of NRC License No. 13-32725-01; (4) periodically (at least annually) review the radiation protection program content and implementation, as required by 10 CFR 20.1101(c); and (5) comply with all applicable requirements of the U.S. Department of Transportation (DOT) regulations in 49 CFR parts 107, 171 through 180, and 390 through 397, as required by 10 CFR 71.5. These violations are cited in the enclosed Notice of Violation (Notice). The NRC is citing the violations in the Notice because the inspector identified the violations.

You are required to respond in writing to the Severity Level IV violations identified in this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In addition, the NRC is concerned about the level of management oversight of the radiation protection program at Patriot Engineering and Environmental, Inc. The failure to conduct regular program audits and the lack of dialogue between facilities regarding the radiation safety program were missed opportunities to identify many of the issues described in the enclosed inspection report. There may also be good practices related to safety and security requirements at some of your locations of use that may be of benefit to other locations of use on your license. In addition to responding to the specific violations in the enclosed Notice, please provide information in your written response addressing how Patriot Engineering and Environmental, Inc., will improve its management oversight of the radiation protection program.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response, 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>. To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be made publicly available without redaction.

J. Sherer

- 4 -

Please feel free to contact Mr. Bramnik of my staff if you have any questions regarding this inspection. You can reach Mr. Bramnik at 630-829-9543.

Sincerely,

/RA/

Patrick L. Loudon, Director
Division of Nuclear Materials Safety

Docket No. 030-37878
License No. 13-32725-01

Enclosures:

1. Notice of Violation
2. Inspection Report No. 03037878/2014001(DNMS)

cc w/encls: State of Indiana
Mr. John Phillips, Corporate Radiation Safety Officer

J. Sherer

- 4 -

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Letter to James Sherer from Patrick L. Loudon, dated May 19, 2014

SUBJECT: NRC ROUTINE INSPECTION REPORT NO. 03037878/2014001(DNMS) –
PATRIOT ENGINEERING AND ENVIRONMENTAL, INC.

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NOTICE OF VIOLATION

Patriot Engineering and Environmental, Inc.
Terre Haute, Indiana

Docket No. 030-37878
License No. 13-32725-01

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted on March 27 and 28, 2014, with continuing in-office review through April 21, 2014, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

- A. Title 10 of the *Code of Federal Regulations* (CFR) Section 30.34(c) states, in part, that each person licensed by the Commission pursuant to the regulations in this part and parts 31 through 36 and 39 shall confine his possession and use of the byproduct material to the locations and purposes authorized in the license.

Condition 10 of NRC License No. 13-32725-01 states that licensed material may be used or stored at specific licensee facilities located in Indianapolis, Evansville, Lafayette, Terre Haute, and Fort Wayne, Indiana, and may be used at temporary job sites of the licensee anywhere in the United States where the U.S. Nuclear Regulatory Commission maintains jurisdiction for regulating the use of licensed material.

Contrary to the above, since January 2010, the licensee failed to confine his possession of byproduct material to the locations authorized in the license. Specifically, the licensee stored portable gauges containing sealed sources of radium-226, cesium-137, and americium-241 at a location in Fort Wayne, Indiana, that was not authorized by the license.

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

- B. Condition 15 of NRC License No. 13-32725-01 states that the licensee shall conduct a physical inventory every 6 months, or at other intervals approved by the U.S. Nuclear Regulatory Commission, to account for all sources and/or devices received and possessed under the license.

Contrary to the above, the licensee failed to conduct a physical inventory every 6 months and was not approved by the NRC to conduct inventories at a different interval. Specifically, the licensee did not conduct a physical inventory of its portable gauges containing sealed sources of radium-226 at its Indianapolis location between March 12, 2012 and October 15, 2012, or between October 15, 2012 and July 2, 2013, periods greater than 6 months.

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

- C. Condition 13.A of NRC License No. 13-32725-01 states that sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by NRC under 10 CFR 32.210 or by an Agreement State.

Certificate of Registration No. NR-0587-D-104-S dated May 25, 2004, which was issued by the NRC under 10 CFR 32.210, states, in part, that the leak test frequencies for Model No. C-100, C-200, and C-300 series portable moisture and density gauges manufactured by Seaman Nuclear Corporation are 6 months.

Contrary to the above, the licensee failed to test sealed sources of radium-226 for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration. Specifically, the licensee failed to test sealed sources contained in eight Model No. C-200 and six Model No. C-300 gauges stored at its Indianapolis location between March 12, 2012 and October 15, 2012, or between October 15, 2012 and July 22, 2013, periods greater than 6 months.

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

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

Contrary to the above, since January 2010, the licensee failed to periodically review the radiation protection program content and implementation. Specifically, the licensee had not conducted annual audits for content or implementation of the radiation protection program at its Fort Wayne location.

This is a Severity Level IV violation (Section 6.7).

- E. Title 10 CFR 71.5(a) requires that a licensee who transports licensed material outside of the site of usage, as specified in the NRC license, or where transport is on public highways, or who delivers licensed material to a carrier for transport, 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.

1. Title 49 CFR 172.200(a) requires, with exceptions not applicable here, that each person who offers a hazardous material for transportation shall describe the hazardous material on the shipping paper in the manner required by subpart C of 49 CFR Part 172. Pursuant to 49 CFR 172.101, radioactive material is classified as hazardous material.

Title 49 CFR 172.202(a) and (b) require in part, with exceptions not applicable here, that the shipping description of a hazardous material on the shipping paper include, in the following sequence: (1) the proper shipping name prescribed for the material in 172.101; (2) the hazard class prescribed for the material as shown in Column 3 of the 172.101 Table; and (3) the identification number prescribed for the material as shown in Column 4 of the 172.101 Table.

Contrary to the requirement, on multiple occasions since 2009 including May 9, 2013, October 3, 2013, and March 17 through 21, 2014, the licensee transported portable gauges containing sealed sources of radioactive material outside the confines of its plant and the shipping description on the shipping paper that accompanied the shipment did not include either the proper shipping name or identification number. Specifically, at its Indianapolis and Fort Wayne locations, the licensee used shipping papers with shipping description of "Radium 226, solid, salt" and identification number of UN2982, and the correct shipping description was "Radium 226, solid, salt mixed with beryllium" and correct identification number was UN2915.

2. Title 49 CFR 172.403 requires, in part, with exceptions not applicable here, that each package of radioactive material be labeled, as appropriate, with two RADIOACTIVE WHITE-I, RADIOACTIVE YELLOW-II, or RADIOACTIVE YELLOW-III labels on opposite sides of the package. The contents, activity, and transport index must be entered in the blank spaces on the label using a legible and durable, weather resistant means. The contents entered on the label must include the name or abbreviation (e.g., 99Mo) of the radionuclides as taken from the listing in 49 CFR 173.435, or for mixtures of radionuclides, those nuclides determined in accordance with the provisions of 49 CFR 173.433(f), with consideration of space available on the label. The activity must be expressed in terms of the appropriate SI units (e.g., Becquerel, Terabecquerel etc...), or in terms of appropriate SI units followed by customary units (e.g., curies, millicuries, or microcuries).

Contrary to the requirement, on multiple occasions since 2009 including May 9, 2013, October 3, 2013, and March 17 through 21, 2014, the licensee transported portable gauges containing sealed sources of radioactive material outside the confines of its plant and each package was not labeled as appropriate. Specifically, on multiple occasions packages were transported with no or one RADIOACTIVE YELLOW-II label, and on multiple occasions packages were transported and the RADIOACTIVE label did not identify the contents, activity, or transport index.

3. Title 49 CFR 172.702 requires that each hazmat employer shall ensure that each hazmat employee is trained and tested, and that no hazmat employee performs any function subject to the requirements of 49 CFR Parts 171-177 unless trained, in accordance with Subpart H of 49 CFR Part 172. The terms Hazmat Employer and Hazmat Employee are defined in 49 CFR 171.8.

Title 49 CFR 172.704(a) specifies the elements of hazmat employee training as: (1) general awareness/familiarization training, (2) function-specific training, and (3) safety training. 49 CFR 172.704(c) requires, in part, that a hazmat employee receive initial training, and recurrent training at least once every three years.

Contrary to the requirement, as of December 6, 2011, the licensee did not provide training for its hazmat employees that satisfied the requirements in Subpart H to 49 CFR Part 172, in that recurrent training had not been completed at least once every three years for all of its employees who transported hazardous materials, and

the licensee otherwise meets the definition of a hazmat employer in 49 CFR 171.8. Specifically, three employees at the Fort Wayne location last completed recurrent training on December 6, 2008; therefore, these individuals required recurrent training on December 6, 2011. On multiple occasions since December 6, 2011, including May 9, 2013, October 3, 2013, and March 17 through 21, 2014, the individuals transported portable gauges containing sealed sources of radioactive material and had not completed required recurrent hazmat training.

This is a Severity Level IV problem (Section 6.8).

Pursuant to the provisions of 10 CFR 2.201, Patriot Engineering and Environmental, Inc. is hereby required to submit a written statement or explanation 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 of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance was or will be achieved. Your response may reference or include previously docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

Your response 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>. Therefore, to the extent possible, the response should not include any personal privacy, proprietary, or safeguards information so that it can be made publicly available 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.

Dated this 19th day of May 2014.

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

Docket No. 030-37878

License No. 13-32725-01

Report No. 03037878/2014001(DNMS)

EA No. EA-14-060

Licensee: Patriot Engineering and Environmental, Inc.

Facilities: Indianapolis office
Fort Wayne office
Lafayette office

Inspection Dates: March 27 and 28, 2014, with continued
in-office review through April 21, 2014

Inspectors: Andrew M. Bramnik, Health Physicist
Geoffrey M. Warren, Senior Health Physicist

Approved By: Aaron T. McCraw, Chief
Materials Inspection Branch
Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

Patriot Engineering and Environmental, Inc. NRC Inspection Report 03037878/2014001(DNMS)

This was a routine inspection of licensed activities involving the use of byproduct material in portable gauging devices for measuring physical properties of materials. The licensee was authorized under U.S. Nuclear Regulatory Commission (NRC) Materials License No. 13-32725-01 to use or store portable gauges containing radium-226, cesium-137, and americium-241 at specific addresses in five Indiana cities in addition to use at temporary job sites anywhere in the United States in areas of NRC jurisdiction. Two NRC inspectors conducted observations at three of the licensee's five locations.

The inspector identified an apparent violation of Condition 17 of NRC License No. 13-32725-01, which reiterated the requirement in Title 10 of the *Code of Federal Regulations* (CFR) Section 30.34(i), in which the licensee failed to use a minimum of two independent physical controls that form tangible barriers to secure portable gauges when the gauges were not under the control and constant surveillance of the licensee. Specifically, the licensee temporarily stored seven portable gauges containing radium-226 and two portable gauges each containing cesium-137 and americium-241 in its Fort Wayne facility during a construction project, and the gauges were only secured from unauthorized removal by one physical control. Additionally, individuals at the licensee's Fort Wayne and Indianapolis locations stated that on multiple occasions since 2009 they had left portable gauges containing radium-226 on open, flatbed pickup trucks that were not under their control or constant surveillance, and had only secured the gauges from unauthorized removal by one physical control.

As corrective actions, on March 28, 2014, the licensee immediately secured its portable gauges into its regular storage location at the Fort Wayne facility. On March 31, 2014, the licensee e-mailed the inspector photos of the finished result. On March 27, 2014, the Indianapolis site radiation safety officer (RSO) retrained gauge users to use an additional padlock so that their transportation configuration would meet the two-barrier rule. On March 28 and 31, 2014, the Fort Wayne site RSO also retrained gauge users to use additional means while transporting gauges to meet the two-barrier rule. Both site RSOs committed to work with the corporate RSO and their site RSO counterparts to develop a company-wide policy for securing gauges in accordance with the two-barrier rule.

The inspectors also identified seven Severity Level IV violations. Three violations involving transporting radioactive material have been grouped into a Severity Level IV problem. The violations involved the licensee's failure to: (1) apply for and receive a license amendment before changing a permanent storage location in January 2010, as required by 10 CFR 30.34(c); (2) conduct a physical inventory of all sealed sources and devices possessed under the license every six months, as required by Condition 15 of NRC License No. 13-32725-01; (3) test sealed sources for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration, as required by Condition 13.A of NRC License No. 13-32725-01; (4) periodically (at least annually) review the radiation protection program content and implementation, as required by 10 CFR 20.1101(c); and (5) comply with all applicable requirements of the U.S. Department of Transportation (DOT) regulations in 49 CFR parts 107, 171 through 180, and 390 through 397, as required by 10 CFR 71.5.

Report Details

1 Program Overview

Patriot Engineering and Environmental, Inc. was authorized under NRC Materials License No. 13-32725-01 to use licensed material in portable gauging devices for measuring physical properties of materials. Condition 10 of the NRC License authorized the use or storage of licensed material at specific addresses in five Indiana cities in addition to use at temporary job sites anywhere in the United States in areas of NRC jurisdiction. Condition 12 of the license listed a specific site RSO for each permanent storage location. Condition 12 also listed the Terre Haute site RSO as the corporate RSO; however, he did not have oversight or management responsibilities outside of the Terre Haute location. The licensee's staff members used the gauges on a daily basis for construction engineering projects throughout Indiana. The licensee primarily used Seaman Nuclear Corporation gauges containing radium-226 at each of its locations, specifically Model Numbers C-75, C-200, and C-300. In addition, the licensee's Fort Wayne location possessed two Troxler Model 3400 series portable gauges that each contained sealed sources of cesium-137 and americium-241. The licensee was authorized to possess up to 60 radium gauges and up to 10 cesium/americium gauges. At the time of the inspection, the licensee possessed 27 gauges at its Indianapolis location and approximately 8 gauges at each of its other four locations.

2 Security of Portable Gauges

2.1 Inspection Scope

The inspectors interviewed selected personnel and observed the licensee's methods of securing portable gauges both in storage and in transport at the Indianapolis, Fort Wayne, and Lafayette locations.

2.2 Observations and Findings

On March 27, 2014, an inspector initiated a routine inspection at the licensee's facility in Indianapolis, Indiana. The inspector interviewed the site RSO, a project manager, and a portable gauge user. The licensee's staff showed the inspector how portable gauges were secured in storage at the Indianapolis location; the gauges were stored in a locked room inside the licensee's secured facility. As part of the routine inspection, the inspector asked the individuals to demonstrate how portable gauges were transported to temporary job sites. The gauge user secured the portable gauge to an open flatbed pickup truck using only one barrier preventing unauthorized removal. The licensee's staff indicated that they had left gauges on trucks outside of their control and constant surveillance in this configuration since 2009, but could not recall specific dates or occurrences.

On March 28, 2014, the inspector continued the routine inspection at the licensee's facility in Fort Wayne, Indiana. The inspector interviewed the site RSO and a portable gauge user. The inspector observed that portable gauges at this location were being stored in an open space with only one barrier preventing unauthorized removal. The

site RSO informed the inspector that the gauges were left in this condition on March 27 and 28, 2014, because his staff was modifying the normal storage location for the gauges. Specifically, the licensee was installing lead blankets to provide additional shielding. The site RSO stated that the gauges were left overnight in the open area because power tools and small construction equipment prevented them from being stored in their normal, locked location.

As part of the routine inspection, the inspector asked the individuals at Fort Wayne to demonstrate how portable gauges were transported to temporary job sites. Both individuals demonstrated securing the portable gauge to an open flatbed pickup truck using the same method as demonstrated in Indianapolis that resulted in only one barrier preventing unauthorized removal. The licensee's staff at Fort Wayne also indicated that they had left gauges on trucks outside of their control and constant surveillance in this configuration since 2009, but could not recall specific dates or occurrences.

Also on March 28, 2014, another NRC inspector continued the routine inspection at the licensee's facility in Lafayette, Indiana. The inspector interviewed the site RSO, a project manager, and the branch manager. The licensee's staff showed the inspector how portable gauges were secured in storage at the Lafayette location; the gauges were stored in a locked closet with multiple locks on the door inside the licensee's secured facility. As part of the routine inspection, the inspector asked the individuals to demonstrate how portable gauges were transported to temporary job sites. The licensee's staff secured portable gauges in one of two ways, each of which used at least two barriers preventing unauthorized removal.

Based on these observations, the inspector identified multiple examples of an apparent violation of Condition 17 of NRC License No. 13-32725-01 – which reiterated the requirement in 10 CFR 30.34(i) – for a failure to use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal, whenever portable gauges were not under the control and constant surveillance of the licensee. Specifically, the licensee temporarily stored seven gauges containing sealed sources of radium-226 and two gauges each containing sealed sources of cesium-137 and americium-241 in an open area at its facility in Fort Wayne with only one barrier preventing unauthorized removal. Additionally, on multiple occasions since 2009, portable gauge users at Indianapolis and Fort Wayne stored portable gauges on pickup trucks outside of their control and constant surveillance with only one barrier preventing unauthorized removal.

Through telephone and in-person discussions, the corporate RSO, the Indianapolis site RSO, and the Fort Wayne site RSO stated their belief that their method for securing portable gauges in transport was in compliance with the two-barrier rule because an unauthorized individual would have to defeat two barriers to remove the gauge from its transport case; however, the inspector explained to them how an unauthorized individual would have to only defeat a single barrier in order to remove the transport case containing the gauge based on the licensee's method of securing the gauge and its transport case. After the inspector's explanation, the licensee understood and acknowledged the finding.

As corrective actions for the apparent violation, on March 27, 2014, the Indianapolis site RSO retrained gauge users to use an additional padlock so that their transportation configuration would meet the two-barrier rule. On March 28 and 31, 2014, the Fort Wayne site RSO also retrained gauge users to use additional means while transporting gauges to meet the two-barrier rule. Both site RSOs committed to work with their site RSO counterparts to develop a company-wide policy for securing gauges in accordance with the two-barrier rule. On March 28, 2014, the licensee immediately secured its portable gauges into its regular storage location at the Fort Wayne facility. On March 31, 2014, the licensee completed its installation of the lead blankets in the regular storage location and e-mailed the inspector photos of the finished result.

Although one level of physical control existed at all times and there was no loss of material, the failures were not isolated because multiple gauge users at two different locations demonstrated how they inadequately secured gauges during transport since 2009. The failures also demonstrated a programmatic weakness because the licensee failed to properly secure gauges both in storage and during transport when not under the control and constant surveillance of the licensee.

On April 1, 2014, the licensee notified the Region III office and the NRC's Headquarters Operations Center that one of their portable gauges had been stolen (NMED Item No. 140187). On the evening of March 31, 2014, a portable gauge user from the Indianapolis office had checked-out a Seaman Model No. C-200 gauge. The user secured the gauge to his open, flat-bed pickup truck and drove it to his residence approximately ten miles away from the permanent storage location. The gauge was stolen from the truck sometime between 1:00 a.m. and 7:30 a.m. on the morning of April 1, 2014. A Region III materials inspector conducted a reactive inspection at the Indianapolis location on April 3, 2014. The inspector determined that the licensee had implemented its corrective actions to secure the gauge in transport in accordance with the two-barrier rule; however, that corrective action did not prevent the theft of the device. The reactive inspection will be documented under NRC Reactive Inspection Report No. 03037878/2014002(DNMS).

2.3 Conclusions

The inspector identified an apparent violation of Condition 17 of NRC License No. 13-32725-01 – which reiterated the requirement in 10 CFR 30.34(i) – in which the licensee failed to use a minimum of two independent physical controls that form tangible barriers to secure portable gauges when the gauges were not under the control and constant surveillance of the licensee.

3 Radiation Safety Program

3.1 Inspection Scope

On March 27 and 28, 2014, the inspectors reviewed the elements of the licensee's radiation safety program including the following: physical inventory records, leak test records, program audits, survey meter functionality, and dosimetry records.

3.2 Observations and Findings

On March 28, 2014, the inspector attempted to visit the licensee at the address listed for its Fort Wayne location; however, the licensee had moved to a different address. The inspector spoke to the corporate RSO by telephone from outside the address listed on the license. The corporate RSO stated that he was not aware that the Fort Wayne office had moved; however, he identified the new address on a business card from his office in Terre Haute. The inspector visited the licensee's new location in Fort Wayne and interviewed the site RSO as well as the branch manager. The licensee's staff stated that they had moved to the new location approximately six miles away from the address listed on the license from late December 2009 to early January 2010. The Fort Wayne site RSO was not familiar with the requirements to receive a license amendment or notify the NRC prior to moving addresses.

Title 10 CFR 30.34(c) states, in part, that each person licensed by the Commission pursuant to the regulations in this part and parts 31 through 36 and 39 shall confine his possession and use of the byproduct material to the locations and purposes authorized in the license. Condition 10 of NRC License No. 13-32725-01 lists specific addresses for the licensee's facilities where licensed material may be used or stored. Contrary to 10 CFR 30.34(c), in January 2010, the licensee failed to apply for and receive a license amendment before changing its permanent storage location in Fort Wayne. This is a Severity Level IV violation of NRC requirements. On April 1, 2014, the licensee submitted an amendment request to close-out the old location and add the new storage location to its NRC license.

On March 27, 2014, the inspector reviewed the licensee's radiation safety program at their Indianapolis location. The inspector observed that the site RSO kept a summary of leak tests from 2013 and 2012 on spreadsheets. The site RSO stated his belief that the leak tests served as physical inventories of the portable gauges and that a log book of gauge usage adequately documented the physical location of each gauge during intervening periods between leak tests.

Condition 15 of NRC License No. 13-32725-01 states that the licensee shall conduct a physical inventory every 6 months, or at other intervals approved by the NRC, to account for all sources and/or devices received and possessed under the license. Contrary to Condition 15, the licensee failed to conduct a physical inventory every 6 months. Specifically, the licensee had leak tested its gauges on March 12, 2012, October 15, 2012, and July 22, 2013. Each interval between these dates exceeded six months. Over that period of time, the licensee had stored 13 portable gauges that were determined to be "out of service" due to various issues, such as inaccurate readings and inability to hold battery charges. These gauges were not recorded on the usage log book and were not physically inventoried except during leak tests on the dates above. The failure to conduct a physical inventory to account for all sources and devices under its license every 6 months is a Severity Level IV violation of NRC requirements.

Condition 13.A of NRC License No. 13-32725-01 states that sealed sources shall be tested for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration issued by NRC under 10 CFR 32.210 or by an Agreement

State. Certificate of Registration No. NR-0587-D-104-S in the Registry of Radioactive Sealed Sources and Devices, dated May 25, 2004, states, in part, that for Model No. C-100, C-200, and C-300 series portable moisture and density gauges manufactured by Seaman Nuclear Corporation, the leak test frequencies were 6 months.

Contrary to Condition 13.A, the licensee failed to test its portable gauges for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration. Specifically, the licensee failed to test sealed sources contained in eight Model No. C-200 gauges and six Model No. C-300 gauges stored at its Indianapolis location between March 12, 2012, and October 15, 2012; and between October 15, 2012, and July 22, 2013, which are periods greater than 6 months. The failure to test sealed sources for leakage and/or contamination at the required intervals is a Severity Level IV violation of NRC requirements.

On March 28, 2014, the inspector reviewed the licensee's radiation safety program at the Fort Wayne location. In response to an inquiry from the inspector, the site RSO stated that he did not perform annual or regular audits of the radiation protection program. The corporate RSO informed the inspector via telephone that although he originally intended to audit the licensee's other locations, he had not completed or documented any such audits.

Title 10 CFR 20.1101(c) states that that the licensee shall periodically (at least annually) review the radiation protection program content and implementation. Contrary to 10 CFR 20.1101(c), since January 2010, the licensee failed to periodically review their radiation protection program. Specifically, the licensee had not conducted annual audits for content or implementation of the radiation protection program at the Fort Wayne location or across the company as a whole. The failure to periodically review the radiation protection program is a Severity Level IV violation of NRC requirements.

In its license application dated November 24, 2008, the licensee committed to possess and use a radiation survey meter that met the criteria in NUREG-1556, Volume 1, Revision 1, "Consolidated Guidance about Materials Licenses: Program-Specific Guidance about Portable Gauge Licenses." The inspector observed that the licensee possessed survey meters at its Indianapolis and Fort Wayne locations. The inspector determined that the licensee's survey meters were operational and performed comparably to a calibrated NRC survey meter.

In its facsimile dated January 16, 2009, the licensee committed to "maintain, for inspection by NRC, documentation demonstrating that unmonitored individuals are not likely to receive, in one year, a radiation dose in excess of 10 percent of the allowable limits in 10 CFR part 20," or "provide dosimetry processed and evaluated by a NVLAP-approved processor that is exchanged at a frequency recommended by the processor." The corporate RSO maintained a worksheet demonstrating through calculations that unmonitored individuals were not likely to exceed 300 millirem in one year, or less than 10 percent of the occupational dose limits in 10 CFR Part 20. The inspector found that the licensee's calculations were adequate and still applicable to the licensee's level of gauge use at the time of the inspection.

3.3 Conclusions

The inspectors reviewed the licensee's permanent storage locations, physical inventory records, leak test records, program audits, survey meters, and dosimetry records. The inspectors identified four Severity Level IV violations regarding the licensee's failure to: (1) apply for and receive a license amendment before changing a permanent storage location; (2) conduct a physical inventory of all sealed sources and devices possessed under the license every 6 months; (3) test sealed sources for leakage and/or contamination at intervals not to exceed the intervals specified in the certificate of registration; and (4) periodically review the radiation protection program content and implementation.

4 **Transportation of Portable Gauges**

4.1 Inspection Scope

On March 27 and 28, 2014, the inspectors reviewed the licensee's actions for transporting portable gauges including shipping papers, marking, labeling, and hazmat training.

4.2 Observations and Findings

As a part of the routine inspection, the inspectors asked the licensee's staff at the Indianapolis, Fort Wayne, and Lafayette locations to demonstrate how they transported portable gauges to temporary job sites. The licensee's staff at all three locations was generally aware of DOT requirements; however, the inspector observed multiple examples of the licensee's failure to comply with all DOT requirements at its Fort Wayne and Indianapolis locations.

At each location, the licensee's staff was familiar with the requirement to take shipping papers containing emergency contact and emergency response information with them in their trucks. At the Fort Wayne and Indianapolis locations, the licensee used an outdated shipping paper. Specifically, the licensee used a shipping paper provided by the gauge manufacturer, Seaman Nuclear Corporation, which had not been updated since October 1998. The inspector observed that the shipping paper had an incorrect shipping description and United Nations (UN) identification number.

Title 10 CFR 71.5(a) requires that a licensee who transports licensed material outside of the site of usage, as specified in the NRC license, or where transport is on public highways, or who delivers licensed material to a carrier for transport, comply with the applicable requirements of the regulations appropriate to the mode of transport of the DO in 49 CFR Parts 107, 171-180, and 390-397.

Title 49 CFR 172.200(a) requires, with exceptions not applicable here, that each person who offers a hazardous material for transportation shall describe the hazardous material on the shipping paper in the manner required by subpart C of 49 CFR Part 172. Pursuant to 49 CFR 172.101, radioactive material is classified as hazardous material.

Title 49 CFR 172.202(a) and (b) require in part, with exceptions not applicable here, that the shipping description of a hazardous material on the shipping paper include, in the following sequence: (1) the proper shipping name prescribed for the material in 172.101; (2) the hazard class prescribed for the material as shown in Column 3 of the 172.101 Table; and (3) the identification number prescribed for the material as shown in Column 4 of the 172.101 Table.

Contrary to these requirements, on multiple occasions since 2009 including May 9, 2013, October 3, 2013, and March 17 through 21, 2014, the licensee transported portable gauges containing sealed sources of radioactive material outside the confines of its plant and the shipping description on the shipping paper that accompanied the shipment did not include either the proper shipping name or identification number. Specifically, the licensee used shipping papers with shipping description of "Radium 226, solid, salt" and identification number of UN2982, and the correct shipping description was "Radium 226, solid, salt mixed with beryllium" and correct identification number was UN2915. The failure to include either the proper shipping name or identification number on the shipping paper is a Severity Level IV violation.

At each of the licensee's locations the inspectors observed the marking and labeling on the portable gauge transportation cases. The inspectors observed that the transportation cases were adequately marked with information required by DOT including the hazard class, type, and form of radioactive material. In accordance with DOT regulations, marking and labeling are two separate requirements. At the Fort Wayne and Indianapolis locations, the inspector observed that several cases were missing required RADIOACTIVE YELLOW-II labels, and that other cases had one or no complete labels. The licensee's staff stated that portable gauges had been transported in cases with missing or incomplete labels on multiple occasions.

Title 49 CFR 172.403 requires, in part, with exceptions not applicable here, that each package of radioactive material be labeled, as appropriate, with two RADIOACTIVE WHITE-I, RADIOACTIVE YELLOW-II, or RADIOACTIVE YELLOW-III labels on opposite sides of the package. The contents, activity, and transport index must be entered in the blank spaces on the label using a legible and durable, weather resistant means. The contents entered on the label must include the name or abbreviation (e.g., 99Mo) of the radionuclides as taken from the listing in 49 CFR 173.435, or for mixtures of radionuclides, those nuclides determined in accordance with the provisions of 49 CFR 173.433(f), with consideration of space available on the label. The activity must be expressed in terms of the appropriate System International (SI) units (e.g., Becquerel, Terabecquerel etc...), or in terms of appropriate SI units followed by customary units (e.g., curies, millicuries, or microcuries).

Contrary to this requirement, on multiple occasions since 2009 including May 9, 2013, October 3, 2013, and March 17 through 21, 2014, the licensee transported portable gauges containing sealed sources of radioactive material outside the confines of its plant and each package was not labeled as appropriate. Specifically, packages were transported with no or one RADIOACTIVE YELLOW-II labels, and on multiple occasions packages were transported and the RADIOACTIVE label(s) did not identify the contents, activity, or transport index. The failure to appropriately label packages containing radioactive material is a Severity Level IV violation.

At each of the licensee's locations the inspectors asked about DOT-required hazmat training for portable gauge users. At the Fort Wayne location, all of the licensee's gauge users had completed hazmat training, but the training had expired for three individuals and they had continued to transport packages containing radioactive material.

Title 49 CFR 172.702 requires that each hazmat employer shall ensure that each hazmat employee is trained and tested, and that no hazmat employee performs any function subject to the requirements of 49 CFR Parts 171-177 unless trained, in accordance with Subpart H of 49 CFR Part 172. The terms Hazmat Employer and Hazmat Employee are defined in 49 CFR 171.8.

Title 49 CFR 172.704(a) specifies the elements of hazmat employee training as: (1) general awareness/familiarization training, (2) function-specific training, and (3) safety training; 49 CFR 172.704(c) requires, in part, that a hazmat employee receive initial training, and recurrent training at least once every 3 years.

Contrary to this requirement, on multiple occasions since December 6, 2011, the licensee did not provide training for its hazmat employees that satisfied the requirements in Subpart H of 49 CFR Part 172, in that recurrent training had not been completed at least once every three years for all of its employees who transport hazardous materials, and the licensee otherwise meets the definition of a hazmat employer in 49 CFR 171.8. Specifically, three employees at the Fort Wayne location last completed recurrent training on December 6, 2008; therefore, those individuals required recurrent training as of December 6, 2011. On multiple occasions since December 6, 2011, including May 9, 2013, October 3, 2013, and March 17 through 21, 2014, the individuals transported portable gauges containing sealed sources of radioactive material and had not completed required recurrent hazmat training. The failure to provide recurrent hazmat training is a Severity Level IV violation.

4.3 Conclusions

The inspectors reviewed the licensee's program for transporting portable gauges. The inspectors identified three Severity Level IV violations for the licensee's failure to comply with DOT requirements. Specifically, on multiple occasions the licensee transported portable gauges containing sealed sources of radioactive material outside the confines of its plant and: (A) the shipping description on the shipping paper that accompanied the shipment did not include either the proper shipping name or identification number; (B) packages were transported with no or one RADIOACTIVE YELLOW-II labels, and on multiple occasions packages were transported and the RADIOACTIVE label(s) did not identify the contents, activity, or transport index; and (C) three employees at the Fort Wayne location required recurrent training as of December 6, 2011, but had transported portable gauges containing sealed sources of radioactive material since that date. Because the three violations stem from the same root causes – a lack of programmatic oversight and an incomplete understanding of DOT regulations – the NRC is citing the three transportation-related violations as one Severity Level IV problem.

5 Exit Meeting Summary

The inspectors presented preliminary inspection findings following the onsite inspections via telephone on March 28, 2014, and again on April 21, 2014. The licensee did not identify any documents or processes reviewed by the inspectors as proprietary. The licensee acknowledged the findings presented.

PARTIAL LIST OF PERSONNEL CONTACTED

* John Phillips, Corporate RSO
Ken Sullivan, Indianapolis Site RSO
Jason Cope, Fort Wayne Site RSO
Amy Kolzow, Lafayette Site RSO
Portable Gauge Users and Administrative Staff, as available

* Attended final telephone exit meeting on April 21, 2014

INSPECTION PROCEDURES USED

87124 Fixed and Portable Gauge Programs