



# OFFICE OF THE INSPECTOR GENERAL

U.S. NUCLEAR REGULATORY COMMISSION  
DEFENSE NUCLEAR FACILITIES SAFETY BOARD

## Audit of NRC's Oversight of Low-Level Radioactive Waste

OIG-15-A-20  
September 23, 2015



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**UNITED STATES**  
**NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

**OFFICE OF THE  
INSPECTOR GENERAL**

September 23, 2015

MEMORANDUM TO: Mark A. Satorius  
Executive Director for Operations

FROM: Stephen D. Dingbaum /RA/  
Assistant Inspector General for Audits

SUBJECT: AUDIT OF NRC'S OVERSIGHT OF LOW-LEVEL  
RADIOACTIVE WASTE (OIG-15-A-20)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of NRC's Oversight of Low-Level Radioactive Waste*.

The report presents the results of the subject audit. Following the September 14, 2015, exit conference, agency staff indicated that they had no formal comments for inclusion in this report.

Please provide information on actions taken or planned on each of the recommendations within 30 days of the date of this memorandum. Actions taken or planned are subject to OIG followup as stated in Management Directive 6.1.

We appreciate the cooperation extended to us by members of your staff during the audit. If you have any questions or comments about our report, please contact me at (301) 415-5915 or Sherri Miotla, Team Leader, at (301) 415-5914.

Attachment: As stated



# Office of the Inspector General

U.S. Nuclear Regulatory Commission  
Defense Nuclear Facilities Safety Board

OIG-15-A-20

September 23, 2015

## Results in Brief

### Why We Did This Review

The U.S. Nuclear Regulatory Commission (NRC) regulates the management and storage of radioactive waste produced as a result of NRC-licensed activities. Low-level radioactive waste (LLRW) includes items that have become contaminated with radioactive materials or have become radioactive through exposure to neutron radiation.

Storage of LLRW requires an NRC license. There is no limit as to how long a nuclear power plant can store LLRW onsite at their facility; however, licensees must store waste in accordance with NRC regulations.

The Department of Transportation (DOT) and NRC have a Memorandum of Understanding that assigns NRC the role of assisting DOT in inspecting shippers of radioactive material, resulting in NRC inspectors inspecting against both DOT and NRC regulations at its licensee sites, including operating nuclear power plants.

The audit objective was to determine whether NRC has the requisite processes in place for oversight of LLRW at operating nuclear power plants.

### *Audit of NRC's Oversight of Low-Level Radioactive Waste*

#### What We Found

OIG found that NRC has the requisite processes in place for oversight of LLRW at operating nuclear power plants; however, opportunities exist for improvement. Regional inspectors play a key role in ensuring the safe storage and transportation of LLRW at operating power plants and, thus, must have a clear understanding of all relevant terms and regulations. Currently, they do not as there are varying definitions of the term "long-term storage."

Additionally, OIG found that as the program office, the Office of Nuclear Reactor Regulation's (NRR) role is to provide program direction and guidance, including updates and changes to DOT regulations, to regional inspectors who conduct inspections of LLRW at operating nuclear power plants. However, the Office of Nuclear Material Safety and Safeguards (NMSS) serves as NRC's liaison with DOT and is informed of updates to DOT regulations. Due to a lack of communication and coordination among NMSS, NRR, and the NRC Regions, regional inspectors are not able to rely on NRR and are instead using other methods to become aware of updates to transportation regulations.

#### What We Recommend

This report makes recommendations to increase clarity in NRC documents and improve communication and coordination efforts within NRC pertaining to updates to transportation regulations. Management stated their general agreement with the recommendations in this report and did not provide formal comments.

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## **ABBREVIATIONS AND ACRONYMS**

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DOT	U.S. Department of Transportation
LLRW	low-level radioactive waste
NMSS	Office of Nuclear Material Safety and Safeguards
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OIG	Office of the Inspector General
RAMQC	Radioactive Materials in Quantities of Concern
RIS	Regulatory Issue Summary

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## I. BACKGROUND

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### **What is Low-Level Radioactive Waste at Operating Nuclear Power Plants?**

The U.S. Nuclear Regulatory Commission (NRC) regulates the management and storage of radioactive waste produced as a result of NRC-licensed activities. Low-level radioactive waste (LLRW) includes items, such as protective clothing, tools, filters, rags, and reactor water treatment residues, that have become contaminated with radioactive materials or have become radioactive through exposure to neutron radiation. The radioactivity can range from just above background levels found in nature to very high radioactivity in certain cases. The most intensely radioactive wastes are typically found in reactor water treatment residues and discarded parts from nuclear reactors and small gauges containing radioactive material.

Table 1 gives examples of LLRW generated at operating nuclear power plants.

**Table 1: LLRW at Operating Nuclear Power Plants**

Waste Stream	Description
Dry Active Waste	Waste that is usually created through cleanup or wearing something in a contamination area.
Filters	Filters are used to clean the water and air and have to be disposed of as LLRW.
Hardware	Hardware can be pipes and/or components that become "activated" after exposure to neutron fields or become highly contaminated after contact with radioactive water during reactor operations.
Resins	Resins are small polymer beads or powders used for liquid radioactive waste cleanup, water demineralization, and water decontamination. They work by exchanging ions with the particles in the water. Once they are "spent," or used, resins must be disposed of as LLRW.

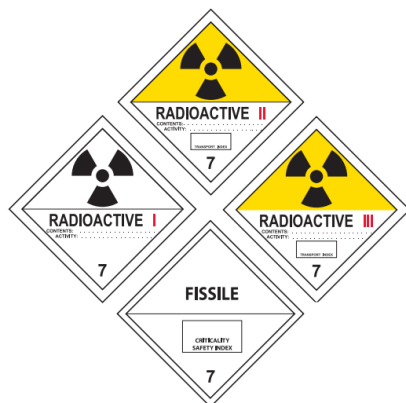
Source: Office of the Inspector General (OIG) Generated

### LLRW Storage Onsite

Storage of LLRW requires an NRC license. There is no time limit as to how long a nuclear power plant can store LLRW onsite. Storage of LLRW varies by each reactor site. However, licensees must store waste in accordance with NRC regulations and their Final Safety Analysis Report. A Final Safety Analysis Report includes information that describes the facility, presents design basis and the limits on its operation, and presents a safety analysis of the structures, systems, and components of the facility as a whole. LLRW is typically stored onsite by licensees until amounts are large enough for shipment to a low-level waste disposal facility.

## The Department of Transportation and NRC

Both the U.S. Department of Transportation (DOT) and NRC have a role in regulating the transportation of radioactive materials. On July 2, 1979, DOT and NRC entered into a Memorandum of Understanding that



delineates the respective responsibilities of both agencies for regulating the safe transportation of radioactive materials. DOT is responsible for regulating safe transportation of hazardous materials, including radioactive materials.<sup>1</sup> DOT's regulations are imposed on shippers and carriers of hazardous materials. NRC is

responsible for regulating the safe receipt, possession, use, and transfer of byproduct, source, and special nuclear material. Additionally, within the past 2 years, DOT, NRC, and the Department of Homeland Security finalized an interagency agreement<sup>2</sup> to ensure the safe transport of radioactive material across the United States.

DOT and NRC conduct inspections and enforcement activities to assure compliance with the regulations. However, the Memorandum of Understanding specifies that NRC will assist DOT in inspecting shippers of radioactive materials. NRC inspectors inspect against DOT and NRC regulations at NRC licensees' sites, including operating nuclear power plants.

<sup>1</sup> DOT has many classes of hazardous materials, including Class 7, which is radioactive material.

<sup>2</sup> NRC signed the agreement in 2013, DOT in 2014, and the Department of Homeland Security in 2015.



## **NRC Offices Involved in Oversight of LLRW**

Multiple NRC offices are involved in the oversight of LLRW at operating nuclear power plants.

NRC has four regional offices and each has a role in the oversight of LLRW. The regional offices (among other responsibilities) execute established NRC policies and programs related to inspection and enforcement for reactors. Inspectors in each region conduct inspections for the processing, storage, and transportation of LLRW.

In addition, the Office of Nuclear Reactor Regulation (NRR) supports NRC's mission to protect public health, safety, and the environment by developing and implementing rulemaking, licensing, oversight, and incident response programs for nuclear reactors. NRR is the program office that owns the Reactor Oversight Process (ROP), which includes the inspection of radioactive waste storage and transportation at nuclear power plants. In this role, NRR provides program direction and guidance to the regional offices on the implementation of ROP.

Lastly, the Office of Nuclear Material Safety and Safeguards (NMSS) is responsible for regulating activities that provide for the safe and secure production of nuclear fuel used in commercial nuclear reactors; the safe storage, transportation, and disposal of high-level radioactive waste and spent nuclear fuel; and the transportation of all radioactive materials (high-level and low-level) regulated under the Atomic Energy Act. NMSS staff serve as NRC's liaison with DOT and have expertise in transportation of radioactive materials.

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## II. OBJECTIVE

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The audit objective was to determine whether NRC has the requisite processes in place for oversight of low-level radioactive waste at operating nuclear power plants.<sup>3</sup> The report appendix describes the audit scope and methodology.

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## III. FINDINGS

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NRC has the requisite processes in place for oversight of LLRW at operating nuclear power plants; however, opportunities exist for improvement. Regional inspectors play a key role in ensuring the safe storage and transportation of LLRW at operating power plants and, thus, must have a clear understanding of all relevant terms and regulations. As the program office, NRR's role is to support the regional inspectors in fulfilling their responsibilities and, therefore, to appropriately field their questions and concerns. The processes NRC has in place for oversight of LLRW at operating nuclear power plants would be improved by

- Clearly defining terms used in current and future NRC documents, specifically the term "long-term storage," or eliminating the usage of the term.
- Developing a mechanism to inform the regional offices of updates to transportation regulations.

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<sup>3</sup> Originally, the audit objective was to determine if NRC has the requisite processes in place for oversight of management, storage, and disposal of low-level waste for NRC licensees. The audit objective was revised on April 23, 2015, to determine if NRC has the requisite processes in place for oversight of low-level radioactive waste at operating nuclear power plants.

## **A. There Are Varying Definitions of Long-Term Storage**

There are varying definitions among NRC staff and external stakeholders regarding the meaning of the term “long-term storage”, relative to LLRW. NRC staff and external stakeholders need to have a cohesive understanding regarding the meaning of “long-term storage”. However, NRC guidance documents lack clarity regarding its meaning. Consequently, the agency’s position is not readily understood or easily applied. Additionally, NRC staff and external stakeholders are left to interpret what “long-term storage” means, which potentially could lead to inconsistency in inspections.

### ***What Is Required***

#### **NRC Staff and External Stakeholders Should Have a Cohesive Understanding Regarding the Meaning of the Term “Long-Term Storage”**

NRC’s Principles of Good Regulation state that regulations should be coherent, logical, and practical. There should be a clear nexus between regulations and agency goals and objectives. In addition, agency positions should be readily understood and easily applied. Moreover, regulatory actions should always be fully consistent with written regulations and should be promptly, fairly, and decisively administered so as to lend stability to the nuclear operations and planning processes.

Further, according to NRC's Strategic Plan, Fiscal Years 2014-2018,<sup>4</sup> the agency should regulate in a manner that clearly communicates requirements and ensures that regulations are consistently applied and practical. The Strategic Plan also highlights that NRC's vision is to be a transparent and effective nuclear regulator.

## ***What We Found***

### **Varying Definitions of the Term "Long-Term" Related to Storage of Low-Level Radioactive Waste**

Currently, there is no time limit on how long NRC licensees can store LLRW onsite at operating nuclear power plants. NRC's position is that the storage of LLRW can be safe as an interim measure, but favors disposal rather than storage. Moreover, NRC's position is that onsite storage is not a substitute for disposal. NRC staff have stated, regardless of how long waste is stored onsite, it is important to ensure that the waste is stored safely.

NRC previously had a 5-year time limit on how long LLRW could be stored onsite before being shipped to a disposal facility. When there was a 5-year time limit, NRC documents that provided guidance to the nuclear industry and NRC staff used terms such as "short-term" and "long-term" storage. "Short-term" storage was defined as added capacity that would provide extended storage to accommodate 1 to 2 years of accumulated LLRW. "Long-term" storage was defined as "life-of-the-plant."

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<sup>4</sup> NUREG-1614, Vol. 6, published September 2014.

### “Long-Term” Is Used in NRC Guidance Documents

In 1994, NRC determined that it could not limit its licensees to storing LLRW for 5 years—thus—the time limit was lifted. However, the term “long-term storage” continues to be used in NRC guidance documents and has implications for NRC staff and licensees.

One example of where the term “long-term storage” continues to be used in NRC guidance documents is in Regulatory Issue Summary<sup>5</sup> (RIS) 2008-32. This RIS states, “When evaluating interim *long-term on-site LLRW storage* [emphasis added], Part 50<sup>6</sup> licensees must consider the applicability of the general design criteria listed in Appendix A.” Thus, the document requires NRC licensees to consider design criteria when evaluating long-term storage of LLRW.

Another example of where the term “long-term storage” continues to be used in is in Inspection Procedure 71124.08.<sup>7</sup> This inspection procedure requires NRC inspectors to “verify that the licensee has established a process for monitoring the impact of *long-term storage* [emphasis added] sufficient to identify potential unmonitored, unplanned release or nonconformance with waste disposal requirements.” NRC inspectors use inspection procedure 71124.08 to conduct inspections of LLRW at operating nuclear power plants.

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<sup>5</sup> A RIS is a document used to communicate with the stakeholders on a broad range of matters that do not involve a request for action or information.

<sup>6</sup> Title 10 Code of Federal Regulations, Part 50, is the regulation for the domestic licensing of production and utilization facilities.

<sup>7</sup> Inspection procedures are statements of requirements and guidance for inspection activities that focus on safety issues. Inspection Procedure 71124.08 is titled “Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation.”

A third example of where the term “long-term storage” continues to be used in NRC guidance documents is found on the NRC’s Web Site for “Low-Level Radioactive Waste/Disused Sources Toolbox for Materials Users.” Within the “Toolbox” are questions such as “I don’t want to mess with disposal of LLRW. Can I just keep it in interim or long term storage at my licensed facility?” NRC answers this question as follows:

Sometimes licensees have LLRW or radioactive sources for disposal whose physical half-lives<sup>8</sup> are too long to allow for decay-in-storage. In these cases, rather than dispose of the material at a licensed facility, licensees often find it easier to just place the items in *interim or long term storage* [emphasis added] at their facilities.

In this example, NRC is answering a question for licensees about what they can and cannot do with their LLRW.

NRC staff (including inspectors) and management gave widely varying definitions regarding the term “long-term storage.” Additionally, external stakeholders were not clear regarding the meaning of “long-term storage.” Table 2 shows some of the responses given to the question of what long-term storage is.

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<sup>8</sup> A half-life is the unit of time it takes a radioactive material to lose half of its radioactivity through decay.

**Table 2: Responses Given to “What is Long-Term Storage?”**

<b>Varying Meaning of the Term “Long-Term Storage”</b>	
<b><u>NRC Staff &amp; Management</u></b>	
•	It’s all interim storage
•	Several months to years
•	More than 2 years
•	50-plus years
•	Life of the plant
•	Waste kept on a more permanent basis
•	Long-term storage refers to high-level waste, not LLRW
<b><u>External Stakeholders</u></b>	
•	Don’t know
•	5 years

***Why This Occurred***

**NRC Documents Lack Clarity Regarding the Meaning of “Long-Term Storage”**

NRC documents do not define the term “long-term storage” as it relates to LLRW, and therefore lack clarity on its meaning. Important NRC documents such as RIS 2008-32, Inspection Procedure 71124.08, and the LLRW “Toolbox” use the term “long-term storage.” The agency expects its inspectors to inspect against Inspection Procedure 71124.08 and its

licensees to store their waste in accordance with RIS 2008-32 and the “Toolbox”; yet, “long-term storage” is not defined.

NRC continues to use the term “long-term” even though there is no regulatory limit on how long waste can be stored onsite. Given that there is no limit as to how long waste can be stored onsite and that NRC staff have said that it is of the utmost important to store the waste safely, regardless of the amount of time, it is also possible that this term could be eliminated from NRC documents.

### ***Why This Is Important***

#### **Agency’s Position Is Not Readily Understood or Easily Applied**

Without a formal definition of the term “long-term storage,” NRC’s position is not readily understood or easily applied. Therefore, NRC is not regulating in a manner that clearly communicates LLRW requirements.

Moreover, without a formal definition of the term “long-term storage,” NRC staff and external stakeholders are left to interpret the meaning of “long-term storage.” This could potentially lead to inconsistencies in the way inspections are conducted. For example, when asked how it is verified that a licensee has established a process for monitoring the impacts of “long-term storage” (per Inspection Procedure 71124.08), an inspector replied never having seen a licensee long-term storage facility or really looking at long-term storage. OIG believes this inspector still conducted a full inspection under Inspection Procedure 71124.08 despite the inspector’s uncertainty on the meaning of the term. It is important for



NRC's inspectors to clearly understand what they are inspecting against; otherwise, there is the potential for inconsistent inspections.

NRC staff and external stakeholders need to have a cohesive understanding regarding the meaning of the term "long-term storage." Alternatively, since there is no longer a time limit for LLRW storage onsite, the term could be eliminated.

### **Recommendation**

OIG recommends that the Executive Director for Operations

1. Define the term "long-term storage" in all future NRC documents. Alternatively, eliminate the term.

### **B. Established Method of Updating Regional Offices Concerning Transportation Regulations Is Being Circumvented**

NRC's established mechanism of the program office (NRR) informing the regional offices of updates to transportation regulations is being circumvented. Significant changes in the regulatory environment should be communicated through established reporting lines to appropriate personnel. However, there is a lack of communication among staff from NMSS, NRR, and the regional offices pertaining to transportation regulations. Without effective communication and coordination among all channels, NRC inspectors could be inspecting against outdated transportation regulations.

## *What Is Required*

### **Significant Changes Should Be Communicated Through Established Reporting Lines**

According to the Government Accountability Office's Standards for Internal Control in the Federal Government, significant changes should be communicated across the entity through established reporting lines to appropriate personnel. This can include changes in external conditions, such as changes in the regulatory environment. In addition, management should internally communicate the necessary quality information to achieve the entity's objective. Quality information is appropriate, current, complete, accurate, accessible, and provided on a timely basis. Effective information and communication are vital for an entity to achieve its objectives.

Management should communicate quality information throughout the entity using established reporting lines. Quality information should be communicated down, across, up, and around reporting lines to all levels of the entity. Management should select appropriate methods to communicate internally and consider a variety of factors in selecting an appropriate method of communication. One factor that should be considered is availability – the information should be readily available to the audience when it is needed.

## *What We Found*

### **Agency's Established Mechanism for Informing the Regional Offices Is Being Circumvented**

As the program office, NRR's role is to provide program direction and guidance to the regional offices and field their questions. Inspectors in the regional offices are not relying on NRR and, thus, they are not following the agency's established mechanism.

Inspectors use methods other than the established agency processes to become aware of updates to transportation regulations or take it upon themselves to stay up to date. Some of the regional offices overwhelmingly rely on people whom regional staff have deemed "transportation experts" in their branch, rather than NRR, when it comes to questions or issues relating to transportation. Similarly, a number of inspectors rely on their colleagues to become aware of revisions to transportation regulations. Other inspectors feel that there is no formal way to become aware of regulatory updates unless they take it upon themselves to stay up to date. One way they might do this is by taking the NRC "Transportation of Radioactive Materials," H-308, course every few years, although it is required only that they take it once. Some inspectors also take external training courses or attend conferences to stay up to date.

Additionally, inspectors in three of the regional offices are responsible for inspecting against eight different inspection procedure attachments at each operating nuclear power plant under their region's jurisdiction. The inspection procedure that relates to oversight of radioactive material transportation is only one of these attachments and is conducted

biennially. As inspectors are responsible for inspecting against eight different inspection procedures at each plant, they do not have the time to seek out transportation updates on their own.

Inspectors should be relying on their program office, NRR, to become informed of updates to transportation regulations, but they are not. NRR is not generally aware of DOT regulation changes and does not currently provide this information reliably to the regions. Instead, they are finding alternative methods of getting the information and are relying on various sources to get this information.

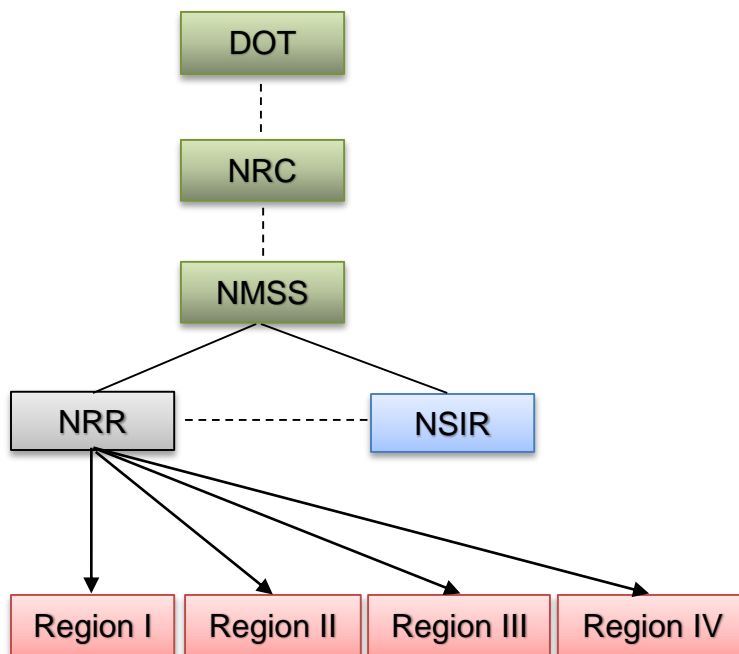
### *Why This Occurred*

#### **Lack of Communication Among Staff From NMSS, NRR, and the Regional Offices Pertaining to Transportation Regulations**

Pertaining to transportation regulations, there is a lack of communication between NRR and NMSS and the two offices are not well coordinated. Therefore, information is not getting to the regional offices in a consistent manner.

NRR provides inspection program direction and guidance to the regional offices and NMSS is the office that serves as agency liaison with the DOT and is informed of updates of DOT regulations. For NRR to learn of updates to transportation regulations so they can then relay that information to the regional offices, they need to be in communication with NMSS. However, the transportation experts in NMSS have very limited interaction with the relevant personnel in NRR.

**Diagram 1: Relationships Among Involved Offices**



NRR coordinates a monthly regional counterpart call where headquarters informs the regional office staff of any regulatory changes and the staff have an opportunity to voice any issues or concerns. The parties on this call are the four regional offices, NRR, and also a representative from the Technical Training Center and the Office of New Reactors. This call could potentially serve as a mechanism through which the regional offices would be informed of updates to transportation regulations; however, the transportation experts in NMSS have never participated in this call. This provides further evidence that the communication channels among NRR, NMSS, and the regional offices are lacking. Additionally, NRC does not offer training on transportation regulations other than the initial H-308 course. NRC requires that its licensees take periodic retraining but does

not even offer periodic retraining to its own inspectors.<sup>9</sup> Regulations require refresher training every 3 years for hazmat employees, including shippers of LLRW, yet NRC does not require, or even offer, refresher training for inspectors inspecting against transportation regulations.

In July 2015, NMSS held a series of three webinars to provide the regional offices and other staff with updates on transportation regulations. The purpose of the webinar was to provide awareness of the amendments to NRC and DOT transportation regulations that were brought about as a result of recent changes contained in the International Atomic Energy Agency publication, "Regulations for the Safe Transport of Radioactive Material, 2009 Edition, IAEA Safety Standards Series No. TS-R-1." This webinar could be a mechanism that NMSS and NRR use to update the regional offices with regard to transportation regulations.

### *Why This Is Important*

#### **NRC Inspectors Could Be Inspecting Against Outdated Transportation Regulations**

Some inspectors take it upon themselves to stay up to date with the regulations. If the inspectors are not able to stay up to date due to time or resource constraints, the inspectors may not become aware of updates to the regulations and inspect against outdated regulations. Because inspectors are getting information regarding updates to transportation regulations from various sources, the updates can be misinterpreted, not

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<sup>9</sup> H-401, "Boiling Water Reactor and Pressurized Water Reactor Operational Chemistry for Health Physics Inspectors," is a required refresher course for health physics inspectors that provides an overview of boiling water reactor and pressurized water reactor operational chemistry including the principles of chemistry controls during operations, startup, and shutdown and the effects on radiation source term and occupational exposure. The H-401 course subjects rotate to cover a wide spectrum of relevant health physics issues. It was not specifically set up to provide periodic (every 3 years) training on transportation regulations.

clearly understood, or the inspector may get the wrong information altogether.

There is no established periodicity with which updates are made to transportation regulations. Consequently, inspectors cannot know when



or how often to check for changes in the regulations. This makes it all the more important for a mechanism to exist through which the program office can inform the regional offices of updates to transportation regulations. An example of a significant change in transportation regulations occurred in March 2010 when DOT published its final rule that modified security plan

requirements applicable to the commercial transportation of hazardous materials by air, rail, vessel, and highway. One of the classes of hazardous material that is subject to the security planning under the final rule is Class 7, so the rule is applicable to NRC Radioactive Materials in Quantities of Concern (RAMQC). As a result of this regulation change, inspectors need to ensure that NRC licensees ship RAMQC in adherence to a security plan. In order for NRC to effectively oversee the transportation of LLRW, it is imperative for inspectors to be aware of updates such as these.

Additionally, poor communication and coordination among the relevant channels results in ineffectiveness throughout the agency. Not only are inspectors potentially inspecting against outdated regulations, but the methods through which they are learning of new regulations or staying up to date are not the most efficient way of doing agency business. Certain

regions rely on staff who colleagues have deemed as internal transportation experts and other inspectors might retake training classes by their own initiative, but the methods that are being used are not the most efficient way to get the updated information to regional staff. A more efficient method would be if all inspectors could rely on the already established program office to get the most updated information to the regions.

### **Recommendation**

OIG recommends that the Executive Director for Operations

2. Develop a mechanism to inform the regional offices of updates to transportation regulations, for example through refresher training, monthly calls, or webinars.



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## **IV. CONSOLIDATED LIST OF RECOMMENDATIONS**

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OIG recommends that the Executive Director for Operations

1. Define the term “long-term storage” in all future NRC documents. Alternatively, eliminate the term.
2. Develop a mechanism to inform the regional offices of updates to transportation regulations, for example through refresher training, monthly calls, or webinars.

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## **V. AGENCY COMMENTS**

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An exit conference was held with the agency on September 14, 2015. Prior to the exit conference, after reviewing a discussion draft, agency management provided comments that have been incorporated into this report, as appropriate. As a result, agency management stated their general agreement with the findings and recommendations and opted not to provide formal comments.

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## OBJECTIVE, SCOPE, AND METHODOLOGY

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### Objective

The audit objective was to determine whether NRC has the requisite processes in place for oversight of low-level radioactive waste at operating nuclear power plants.

### Scope

The audit focused on whether NRC has the requisite processes in place to assure proper oversight of storage and transportation of LLRW at operating nuclear power plants. We conducted this performance audit at NRC headquarters (Rockville, MD) from February 2015 to July 2015. Internal controls related to the audit objective were reviewed and analyzed. Throughout the audit, auditors were aware of the possibility or existence of fraud, waste, or abuse in the program.

### Methodology

OIG reviewed NRC regulations to identify criteria for this audit, including the following:

- Low-Level Radioactive Waste Policy Amendment Act of 1985.
- 10 Code of Federal Regulations Part 20 – “Standards for Protection Against Radiation.”

- 10 Code of Federal Regulations Part 50 – “Domestic Licensing of Production and Utilization Facilities.”
- 10 Code of Federal Regulations Part 61 – “Licensing Requirements for Land Disposal of Radioactive Waste.”
- 10 Code of Federal Regulations Part 71 – “Packaging and Transportation of Radioactive Material.”

OIG identified and reviewed regulatory issue summaries, information notices, generic letters, NUREGs, and SECY papers to identify available guidance relating to the storage and transportation of LLRW at operating nuclear power plants.

In addition, OIG reviewed inspection procedures regarding the inspection requirements for NRC's oversight of storage and transportation of LLRW.

OIG interviewed NRC staff and management to gain an understanding of roles and responsibilities as they relate to NRC oversight of management, storage, and transportation of LLRW. Auditors interviewed staff from NMSS, NRR, the Office of the General Counsel, and Regions I, II, III, and IV. In addition, OIG interviewed staff from the Nuclear Energy Institute. OIG also traveled to Region II in Atlanta, Georgia, and Region III in Lisle, Illinois, to conduct interviews with NRC inspectors and management.

Additionally, audit team members traveled to Calvert Cliffs Nuclear Power Plant and North Anna Power Station to observe inspections conducted by NRC inspectors of storage and transportation of LLRW.

We conducted this performance audit in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

This audit was conducted by Sherri Miotla, Team Leader; Kristen Lipuma, Audit Manager; Kevin Nietmann, Senior Technical Advisor; Avinash Jaigobind, Senior Auditor; Regina Revinzon, Auditor; Meredith Johnson, Management Analyst; and Connor McCune, Student Intern.

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## TO REPORT FRAUD, WASTE, OR ABUSE

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### Please Contact:

Email: [Online Form](#)

Telephone: 1-800-233-3497

TDD 1-800-270-2787

Address: U.S. Nuclear Regulatory Commission  
Office of the Inspector General  
Hotline Program  
Mail Stop O5-E13  
11555 Rockville Pike  
Rockville, MD 20852

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## COMMENTS AND SUGGESTIONS

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If you wish to provide comments on this report, please email OIG using this [link](#).

In addition, if you have suggestions for future OIG audits, please provide them using this [link](#).