



OFFICE OF THE INSPECTOR GENERAL

U.S. NUCLEAR REGULATORY COMMISSION

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

Audit of NRC's Nuclear Power Plant Surveillance Test Inspection Program

OIG-20-A-11

June 16, 2020



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

**OFFICE OF THE
INSPECTOR GENERAL**

June 16, 2020

MEMORANDUM TO: Margaret M. Doane
Executive Director for Operations

FROM: Dr. Brett M. Baker **/RA/**
Assistant Inspector General for Audits

SUBJECT: AUDIT OF NRC'S NUCLEAR POWER PLANT
SURVEILLANCE TEST INSPECTION PROGRAM
(OIG-20-A-11)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of NRC's Nuclear Power Plant Surveillance Test Inspection Program*.

The report presents the results of the subject audit. Following the June 8, 2020, 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 recommendation(s) 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 Paul Rades, Team Leader, at (301) 415-6228.

Attachment: As stated



Office of the Inspector General

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Defense Nuclear Facilities Safety Board

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Results in Brief

Why We Did This Review

NRC's resident and region-based inspectors conduct surveillance test inspections at operating nuclear power reactors to:

1. Verify that surveillance testing activities provide objective evidence that risk or safety significant structures, systems, and components (SSCs) remain capable of performing their intended safety functions and maintain their operational readiness consistent with their design and licensing bases.
2. Verify that testing activities provide objective evidence that Diverse and Flexible Coping Strategies (FLEX) SSCs remain capable of performing their intended functions and maintain their operational readiness consistent with their licensing bases.

The audit objective was to assess NRC's conduct of surveillance test inspection activities relative to inspection procedure 71111.22 requirements.

Audit of NRC's Nuclear Power Plant Surveillance Test Inspection Program

What We Found

NRC should ensure reliability of data used to support inspection program management. However, surveillance test inspection labor hours documented in the agency's Human Resource Management System do not match with data generated from NRC's Replacement Reactor Program System. This occurs because NRC lacks guidance stipulating the periodic review of surveillance test inspection hours in the Replacement Reactor Program System. Improving data quality from the Replacement Reactor Program System can enhance the effectiveness of inspection monitoring in the Reactor Oversight Process Self-Assessment Program.

What We Recommend

This report makes two recommendations to support periodically reviewing surveillance test inspection hours in the agency's Replacement Reactor Program System.

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ABBREVIATIONS AND ACRONYMS

FLEX	Diverse and Flexible Coping Strategies
HRMS	Human Resources Management System
NRC	Nuclear Regulatory Commission
OIG	Office of the Inspector General
RRPS	Replacement Reactor Program System
SSCS	Safety-Significant Structure, Systems, and Components

I. BACKGROUND

Surveillance Test Inspection Program

As part of the U.S. Nuclear Regulatory Commission's (NRC) Reactor Oversight Process Risk-Informed Baseline Inspection Program,¹ NRC's resident and region-based inspectors conduct surveillance test inspections at operating nuclear power reactors to:

1. Verify that surveillance testing activities provide objective evidence that risk or safety significant structures, systems, and components (SSCs) remain capable of performing their intended safety functions and maintain their operational readiness consistent with their design and licensing bases.
2. Verify that testing activities provide objective evidence that Diverse and Flexible Coping Strategies (FLEX)² SSCs remain capable of performing their intended functions and maintain their operational readiness consistent with their licensing bases.

Resident and region-based inspectors are required to conduct 13 to 21 surveillance test inspection samples per nuclear power reactor site annually. In calendar years 2018 and 2019, NRC conducted 1,059 and 1,036 samples, respectively. Additionally, NRC met the annual sample requirements per nuclear power reactor site.

¹ NRC's Reactor Oversight Process Risk-Informed Baseline Inspection Program is the minimum inspection oversight for all power reactor licensees.

² In the aftermath of a major earthquake and tsunami causing the Fukushima Dai-ichi accident, the nuclear power reactor industry and NRC worked to define and deploy strategies that will enhance their ability to cope with conditions resulting from beyond-design basis external events. The purpose of FLEX is to outline the process to be used by individual licensees to define and implement site-specific diverse and flexible mitigation strategies that reduce the risks associated with beyond-design basis conditions.

NRC's Surveillance Test Inspection Roles and Responsibilities

NRC's Office of Nuclear Reactor Regulation is responsible for the overall management, support, and oversight of surveillance test inspections, including updates of surveillance test inspection procedures. The Division of Reactor Oversight within the Office of Nuclear Reactor Regulation revises reactor inspection procedures and oversees regional implementation. NRC inspectors are responsible for performing surveillance test inspections, while regional managers are responsible for ensuring surveillance test inspections are completed in accordance with agency guidance. NRC has budgeted 5,700 hours for surveillance test inspections, which is equivalent to approximately 3.8 Full-time Equivalents.³

³At an agency level, NRC has budgeted 2,993 Full-time Equivalents for Fiscal Year 2020. Full-time Equivalent is a human resources measurement equal to one staff person working full-time for one year.

II. OBJECTIVE

The audit objective was to assess NRC's conduct of surveillance test inspection activities relative to inspection procedure 71111.22 requirements. Appendix A contains information on the audit scope and methodology.

III. FINDING

NRC conducts surveillance test inspection activities in accordance with inspection procedure 71111.22 requirements. However, NRC could benefit from implementing guidance to periodically review surveillance test inspection hours in the agency's Replacement Reactor Program System (RRPS).⁴

A. NRC Inspection Labor Hour Data Needs Periodic Quality Assurance Checks

NRC should ensure reliability of data used to support inspection program management. However, surveillance test inspection labor hours documented in the agency's Human Resource Management System (HRMS)⁵ do not match with data generated from RRPS. This occurs because NRC lacks guidance stipulating the periodic review of surveillance test inspection hours in RRPS. Improving data quality from RRPS can enhance the effectiveness of inspection monitoring in the Reactor Oversight Process Self-Assessment Program.

⁴ RRPS is a web-based application that is designed to, among other things, capture inspection activities.

⁵ HRMS is NRC's time and labor system.

What Is Required

NRC Should Ensure Reliability of Data Used to Support Inspection Program Management

According to Federal Government internal control guidance,⁶ agency managers are responsible for ensuring processed data is accurate, complete, accessible, and timely. Agencies use such information to make informed decisions regarding use and prioritization of resources, as well as evaluating agency performance and potential risk areas that could affect efficiency and effectiveness.

What is internal control?

Internal control is a process used by management to help an entity achieve its objectives.

How does internal control work?

Internal control helps an entity

- Run its operations efficiently and effectively
- Report reliable information about its operations and,
- Comply with applicable laws and regulations.

What We Found

Surveillance Test Inspection Hours Documented in HRMS Do Not Match with Data Generated from RRPS

OIG analyzed surveillance test inspection labor hours documented in the agency's HRMS and RRPS for calendar years 2018 and 2019, and found data discrepancies⁷ among all four regions.

⁶ Government Accountability Office, [Standards for Internal Control in the Federal Government, GAO-14-704G, September 2014](#).

⁷ This is the fourth audit report where OIG has found unreliable data generated from RRPS. The other three audit reports that found unreliable data are: [Audit of NRC's Special and Infrequently Perform Inspections \(OIG-18-A-13\)](#), [Audit of NRC's Process for Modifying and Communicating Standard Technical Specifications \(OIG-18-A-15\)](#) and, the [Audit of NRC's License Amendment Request Acceptance Review Process \(OIG-19-A-05\)](#).

The discrepancies for Regions II, III, and IV were approximately two percent or lower for both years. However, Region I data discrepancies varied by 14.6 percent and 11.5 percent in 2018 and 2019, respectively. Figure 1 shows surveillance test inspection hours documented in the two data systems for 2018 and 2019, along with the data discrepancies measured in nominal and percentage terms.⁸

Figure 1: Surveillance Test Inspection Hours Comparison Between RRPS and HRMS 2018-2019

2018				
Region	RRPS	HRMS	Delta (nominal)	Delta (percentage)
Region I	1122	1313.25	191.25	14.6%
Region II	1603	1638.75	35.75	2.2%
Region III	1203.75	1187.75	16	1.3%
Region IV	1248.5	1233.5	15	1.2%
2019				
Region I	1135.5	1282.5	147	11.5%
Region II	1382.5	1381.25	1.25	0.1%
Region III	1078.75	1081.5	2.75	0.3%
Region IV	1233.5	1253.75	20.25	1.6%

Source: OIG's analysis of HRMS and RRPS data.

Why This Occurred

NRC Lacks Guidance to Support Periodic Review

Region I had the largest data discrepancy because RRPS was programmed to select only operating nuclear power reactors when producing reports for inspection labor hours. During the fieldwork phase of the audit, NRC staff modified the RRPS report to include both operating and decommissioning⁹ nuclear power reactors. Additionally, NRC lacks guidance to support periodic review of data generated from RRPS.

⁸ OIG found no evidence that the inaccurate labor hours generated from RRPS represent fee billing errors.

⁹ In 2018, Oyster Creek Nuclear Generating Station ceased operations. Additionally, Pilgrim Nuclear Power Station and Three Mile Island Nuclear Generating Station Unit 1 ceased operations in 2019.

Why This Is Important

Improving Data Quality Can Enhance the Effectiveness of Inspection Monitoring in the Reactor Oversight Process Self-Assessment Program

NRC staff relies on data generated from RRPS for the agency's Reactor Oversight Process Self-Assessment Program, which is used to monitor the overall effectiveness of inspection procedures. If the data is inaccurate, it could adversely affect the level of effort prescribed by future inspection procedure revisions.

Recommendations

OIG recommends that the Executive Director for Operations

1. Implement policies and procedures to periodically review the completeness and accuracy of data generated from the Replacement Reactor Program System.
2. Periodically test data generated from the Replacement Reactor Program System for completeness and accuracy.

IV. AGENCY COMMENTS

An exit conference was held with the agency on June 8, 2020. Prior to this meeting, 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 finding and recommendations in this report and opted not to provide formal comments for inclusion in this report.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The audit objective was to assess NRC's conduct of surveillance test inspection activities relative to inspection procedure 71111.22 requirements.

Scope

The audit focused on determining whether NRC met the requirements stipulated in inspection procedure 71111.22. We conducted this performance audit from October 2019 through May 2020 at NRC headquarters in Rockville, Maryland. We analyzed RRPS data for January 2018 through December 2019 period, and compared it to HRMS data representing the same time period to identify discrepancies between the two data sets. OIG used HRMS data as the basis for its audit finding. OIG performed a data reliability test of HRMS, and determined the data produced from this system provide a reliable basis for analyzing RRPS data. Internal controls related to the audit objective were reviewed and analyzed.

Methodology

To accomplish the audit objective, OIG analyzed relevant criteria for this audit including:

- Government Accountability Office, *Standards for Internal Control in the Federal Government*, GAO-14-704G, September 2014.
- United States Code of Federal Regulation Title 10, Part 50, *Domestic Licensing of Production and Utilization Facilities*.
- United States Code of Federal Regulation Title 10, Part 50.155, *Mitigation of Beyond-Design-Basis Events*.

- NRC Order EA-12-049, *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events*, March 12, 2012.
- NRC Regulatory Guide 1.226, Revision 0, *Flexible Mitigation Strategies for Beyond-Design Basis Events*, June 2019.
- Nuclear Energy Institute, NEI 12-06, Revision 4, *Diverse and Flexible Coping Strategies (FLEX) Implementation Guide*, December 2016.
- Inspection Manual Chapter 2515 Appendix A, *Risk-Informed Baseline Inspection Program*, July 26, 2019.
- Inspection Manual Chapter 0308, *Reactor Oversight Process Basis Document*, January 1, 2018.
- Inspection Manual Chapter 0609 Appendix A, *The Significance Determination Process for Findings At-Power*, December 20, 2019.
- Inspection Manual Chapter 0307, Appendix B, *Reactor Oversight Process Baseline Inspection Procedure Assessments and Reviews*, August 25, 2017.
- Inspection Procedure 71111 Attachment 22, *Surveillance Testing*, January 01, 2020.

OIG conducted analyses to determine whether the agency met the requirements stipulated in Inspection Procedure 71111.22. OIG also identified surveillance test inspection labor hour discrepancies generated from NRC's RRPS for calendar years 2018 and 2019. We compared labor hours charged for surveillance test inspections in HRMS to surveillance test inspection labor hour data generated by RRPS reports. OIG verified discrepancies between the two data sources and ascertained their causes in discussions with cognizant NRC staff. Additionally, OIG interviewed NRC staff and management from the regions and headquarters.

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. Throughout the audit, auditors considered the possibility of fraud, waste, and abuse in the program.

The audit was conducted by Paul Rades, Team Leader; Avinash Jaigobind, Audit Manager; Tim Wilson, Audit Manager; John Thorp, Senior Technical Advisor; and Ebaide Esoimeme, Senior Auditor.

TO REPORT FRAUD, WASTE, OR ABUSE

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COMMENTS AND SUGGESTIONS

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](#).