



OFFICE OF THE INSPECTOR GENERAL

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

Audit of NRC's Oversight of Supplemental Inspection Corrective Actions

OIG-19-A-19

September 13, 2019



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

**OFFICE OF THE
INSPECTOR GENERAL**

September 13, 2019

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 OVERSIGHT OF SUPPLEMENTAL
INSPECTION CORRECTIVE ACTIONS (OIG-19-A-19)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of NRC's Oversight of Supplemental Inspection Corrective Actions*.

The report presents the results of the subject audit. Following the September 9, 2019, 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

The U.S. Nuclear Regulatory Commission's (NRC) Reactor Oversight Process (ROP) verifies that U.S. reactors are operating in accordance with NRC rules, regulations, and license requirements.

NRC staff uses the ROP to evaluate NRC inspection findings and performance indicators records for each reactor and uses this information to assess the reactor's safety performance and security measures. While performance indicators can provide insights into plant performance in selected areas, the NRC's supplemental inspection program provides in-depth information for monitoring and assessing plant performance.

The audit objective was to assess how NRC uses supplemental inspections to verify licensees' corrective actions, and how NRC documents supplemental inspection results.

Audit of NRC's Oversight of Supplemental Inspection Corrective Actions

What We Found

NRC conducts supplemental inspections to assure licensee corrective actions effectively address and preclude repetition of significant performance problems. However, NRC does not centrally organize information about licensees' planned corrective actions associated with 95001 and 95002 supplemental inspections to ensure verification of their effectiveness. This occurs because NRC does not require staff to centrally capture and organize planned corrective actions information associated with 95001 and 95002 supplemental inspections. Improving the consistency and quality of 95001 and 95002 inspection report data, while also leveraging technology to make this information more readily accessible to agency staff and senior management, can reduce the risk of oversight lapses and streamline workflow for greater efficiency.

What We Recommend

This report makes two recommendations to support improved documentation of significant planned corrective actions associated with 95001 and 95002 supplemental inspections. Agency management stated their general agreement with the finding and recommendations in this report.

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ABBREVIATIONS AND ACRONYMS

NRC	US Nuclear Regulatory Commission
OIG	Office of the Inspector General
PI&R	Identification and Resolution of Problems
ROP	Reactor Oversight Process
RRPS	Replacement Reactor Program System

I. BACKGROUND

Reactor Oversight Process

The U.S. Nuclear Regulatory Commission's (NRC) Reactor Oversight Process (ROP) verifies that U.S. reactors are operating in accordance with NRC rules, regulations, and license requirements. If reactor performance declines, NRC increases its oversight to protect public health, safety, and the environment. Increased oversight can range from conducting supplemental inspections to shutting a reactor down.

NRC staff uses the ROP to evaluate NRC inspection findings¹ and performance indicators² records for each reactor and uses this information to assess the reactor's safety performance and security measures. Through the ROP, NRC places each reactor in one of five ROP Action Matrix categories.³ The top category is fully meeting all safety cornerstone⁴ objectives, while the bottom category is unacceptable performance. For each cornerstone, NRC develops findings from inspections and evaluates performance indicator data collected by licensees.

Each performance indicator and inspection finding is measured against the criteria using a color-coded system for safety performance (Figure 1 gives an overview of increasing safety significance):

¹ An Inspection Finding is a performance deficiency determined to be More-than-Minor.

² Performance Indicators provide an objective indication of key attributes of licensee performance in each of the cornerstones. Performance Indicators determine acceptable levels of operation within substantial safety margins. Performance Indicators are designed to be objective and risk-informed to the extent practical, but also accommodate indications of a reduction in defense-in-depth, based on existing regulatory requirements and safety analyses.

³ The five categories are: licensee response, regulatory response, degraded performance, multiple/repetitive degraded cornerstone, and unacceptable performance.

⁴ Cornerstones are nuclear plant activities that are essential for the safe operation of the facility. These cornerstones are grouped under the categories of reactor safety, radiation, and safeguards.

- Green indicates a finding of very low safety significance.
- White indicates a finding of low to moderate safety significance.
- Yellow indicates a finding of substantial safety significance.
- Red indicates a finding of high safety significance.

Figure 1: Reactor Oversight Action Matrix Performance Indicators



Source: NRC

While performance indicators can provide insights into plant performance in selected areas, the NRC's supplemental inspection program provides in-depth information for monitoring and assessing plant performance.

Supplemental Inspection Program

NRC's supplemental inspection program is designed to support NRC's goals of maintaining safety and improving the effectiveness, efficiency, and realism of the regulatory process, and reducing unnecessary regulatory burden. Supplemental inspections are required to provide enhanced information regarding safety at facilities where risk significant performance problems have been identified. These performance problems may be identified either by inspection findings or evaluated as greater-than-green using the Significance Determination Process⁵ or

⁵NRC staff uses the Significance Determination Process to determine the safety or security significance of inspection findings. The process provides an initial screening to identify those inspection findings that do not result in a significant increase in plant risk (a "green finding"). In 2016, OIG conducted an audit of NRC's significance determination process, and published OIG-16-A-21, [Audit of NRC's Significance Determination Process for Reactor Safety](#). The report made four recommendations to improve the overall management of the significance determination process.

when green performance indicator thresholds are exceeded. In general, supplemental inspections are performed for greater-than-green performance problems.

NRC inspectors conduct supplemental inspections in accordance with inspection procedures 95001, 95002, and 95003 to sufficiently challenge aspects of the licensee's evaluation, corrective plans, and actions to ensure that the cause(s) of the performance problem have been correctly identified and that appropriate corrective plans and actions are in place to promptly and effectively address and preclude repetition of significant performance problems. Each inspection procedure becomes deeper and broader as the significance of the performance problems increases.

Table 1 provides an overview of the supplemental inspection procedures.

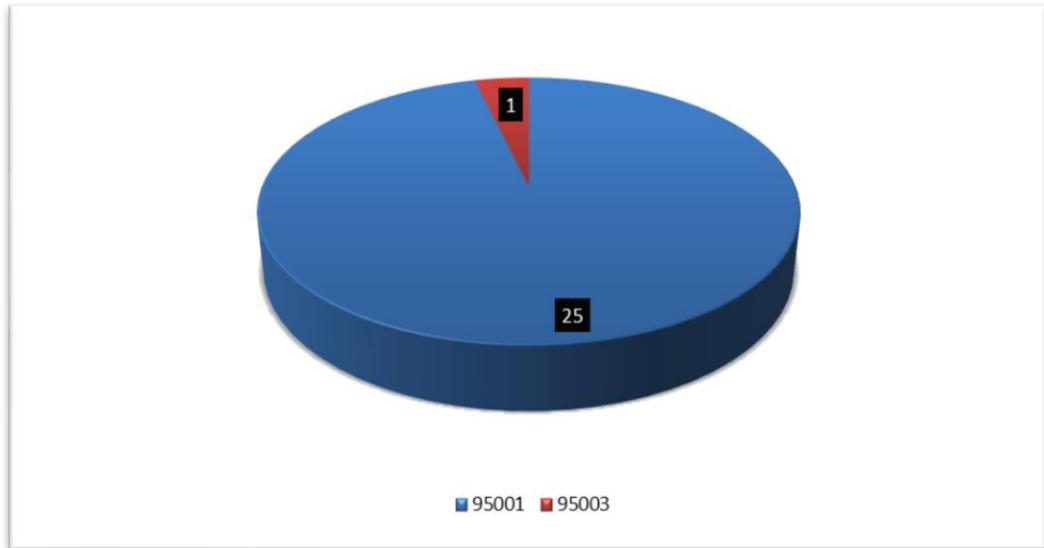
Table 1: Supplemental Inspection Procedures Overview

Supplemental Inspection Procedure	Scope
Inspection Procedure 95001, "Supplemental Inspection for One or Two White Inputs in a Strategic Performance Area"	Inspection reviews licensee's evaluation of root and contributing causes, extent of condition and cause, and corrective actions. It is limited to specific issue(s) or performance area of concern.
Inspection Procedure 95002, "Supplemental Inspection for One Degraded Cornerstone or any Three White Inputs in a Strategic Performance Area"	Inspection reviews licensee's evaluation of root and contributing causes, extent of condition and cause, and corrective actions for both individual and collective issues. It determines if safety culture components caused or significantly contributed to risk significant performance issues and independently assesses the licensee's extent of condition.
Inspection Procedure 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs or One Red Input"	Inspection evaluates the key attributes of affected strategic performance areas to determine if continued operation of the facility is acceptable and whether additional regulatory actions are necessary. It independently assesses the extent of risk significant issues, the adequacy of the programs and processes used to identify, evaluate, and correct performance issues and evaluates the adequacy of programs and processes in the affected strategic performance areas. It develops insights into the overall root and contributing causes of identified performance deficiencies, determines if the NRC oversight process provided sufficient warning to significant reductions in safety, evaluates the licensee's third-party safety culture assessment and conducts a graded assessment of the licensee's safety culture based on evaluation results.

Source: OIG generated from *IMC 2515, Appendix B, Supplemental Inspection Program*.

NRC completed and issued 26 supplemental inspection reports from October 1, 2016, through December 13, 2018. Figure 2 shows the number of completed supplemental inspection reports for 95001 and 95003 inspections.⁶

Figure 2: 95001 and 95003 Inspection Reports Issued Between October 1, 2016, and December 13, 2018



Source: OIG analysis of completed supplemental inspection data from NRC's Replacement Reactor Program System.

NRC's Supplemental Inspection Oversight Roles and Responsibilities

NRC's Office of Nuclear Reactor Regulation is responsible for the overall management, support, and oversight of supplemental inspections, including the language used in the supplemental inspection procedures. The Division of Inspection and Regional Support within the Office of Nuclear Reactor Regulation revises the reactor inspection procedures and oversees regional implementation. NRC inspectors are responsible for performing supplemental inspections, while regional managers oversee these and are responsible for ensuring supplemental inspections are completed.

⁶ There were no 95002-inspections identified between October 1, 2016 and December 13, 2018.

II. OBJECTIVE

The audit objective was to assess how NRC uses supplemental inspections to verify licensees' corrective actions, and how NRC documents supplemental inspection results. Appendix A contains information on the audit scope and methodology.

III. FINDING

NRC generally uses supplemental inspections to verify licensees' corrective actions, and documents supplemental inspection results in accordance with established agency guidance. However, NRC could benefit from higher quality and better organized information regarding corrective actions associated with 95001 and 95002 supplemental inspections at nuclear power plants.

A. NRC Should Improve Supplemental Inspection Corrective Action Information Quality, and Centrally Capture and Organize This Information

NRC conducts supplemental inspections to assure licensee corrective actions effectively address and preclude repetition of significant performance problems. However, NRC does not centrally organize information about licensees' planned corrective actions associated with 95001 and 95002 supplemental inspections to ensure verification of their effectiveness. This occurs because NRC does not require staff to centrally capture and organize planned corrective actions information associated with 95001 and 95002 supplemental inspections. Improving the consistency and quality of 95001 and 95002 inspection report data, while also leveraging technology to make this information more readily accessible to agency staff and senior management, can reduce the risk of oversight lapses and streamline workflow for greater efficiency.

What Is Required

NRC's Supplemental Inspections Should Assure Licensees' Corrective Actions Effectively Address and Preclude Repetition of Significant Performance Problems

According to NRC's supplemental inspection program guidance, Inspection Manual Chapter 2515, Appendix B, *Supplemental Inspection Program*, NRC conducts supplemental inspections to support the agency's goal of maintaining safety and improving the effectiveness, efficiency, and realism of the regulatory process. Specifically, supplemental inspections are performed to assure licensees' corrective actions effectively address and preclude repetition of significant performance problems.

What We Found

NRC Does Not Centrally Capture and Organize Information About Licensees' Planned Corrective Actions Associated with 95001 and 95002 Supplemental Inspections

Unlike corrective actions associated with 95003 supplemental inspections—which are documented through the agency's Confirmatory Action Letter⁷ process—NRC relies on resident inspectors and licensees to manage information on planned corrective actions from 95001 and 95002 supplemental inspections. NRC resident inspectors often manually save planned corrective actions information on white boards or Excel spreadsheets. Additionally, the regions each have different approaches to following up on planned corrective actions. For example, one region follows planned corrective actions through a SharePoint site, whereas another region does through end-of-cycle meeting⁸ documents. Further, licensees maintain corrective action information in their corrective action programs. However, a licensee can change the corrective action information in their corrective action program without notifying NRC. Only

⁷ Confirmatory Action Letters are letters issued to licensees or, if appropriate, to non-licensees subject to NRC jurisdiction to emphasize and confirm an agreement to take certain actions in response to specific problems.

⁸End-of-Cycle meetings are where staff discuss NRC's assessment of the licensee's performance results.

for inspection purposes can NRC access corrective action information in the licensee's corrective action program.

Additionally, among other things, assessments of corrective actions, associated with 95001 and 95002 supplemental inspections are supposed to be documented in supplemental inspection reports. OIG analyzed 25 95001 supplemental inspection reports issued from October 1, 2016, through December 13, 2018. Of these, 14 did not provide sufficient information about planned corrective actions to allow the reader to understand the intended actions. In addition, the level of detail varies among the reports, which could impact the ability of NRC inspectors to efficiently identify planned corrective actions for future follow-up inspections, such as the agency's Baseline Inspection Program, Inspection Procedure 71152, *Identification and Resolution of Problems*⁹ (hereafter, PI&R) inspection. For example, inspectors preparing for PI&R inspections spend time¹⁰ reviewing prior inspection reports, including supplemental inspection reports, to select problems that have been processed through the licensee's corrective action program, to evaluate program effectiveness.

Why This Occurred

Guidance Lacks Clarity on Information Quality, and Agency Lacks Means to Centrally Manage Corrective Action Information

NRC's supplemental inspection guidance—specifically, NRC inspection procedures 95001 and 95002, Inspection Manual Chapter 0611 Appendix C, *Guidance for Supplemental Inspection Reports*, and Inspection Manual Chapter 2515, Appendix B, *Supplemental Inspection Program*—does not specify the level of detail required for documenting planned corrective actions associated with 95001 and 95002 supplemental inspections. Additionally, while 95001 and 95002 supplemental inspections reports are supposed to be saved in the Agencywide Documents Access and

⁹ NRC staff noted they follow up on corrective actions through PI&R inspections. PI&R inspections are conducted biennially and on a sampling basis. On June 28, 2019, NRC staff recommended the Commission change the frequency of PI&R inspections from a biennial to a triennial cycle.

¹⁰ The PI&R biennial team inspection is estimated to take an average of 212 to 288 hours of direct inspection effort.

Management System, NRC does not systematically capture corrective action details from these reports and save them in a data system such as the Replacement Reactor Program System (RRPS). NRC uses RRPS to capture other key elements of reactor inspection results.

Why This Is Important

Oversight and Efficiency Could Be Improved with Higher Quality and More Readily Accessible Information Regarding Supplemental Inspection Corrective Actions

Information regarding corrective actions associated with 95001 and 95002 inspections is important to a variety of NRC oversight activities, including PI&R inspections, end-of-cycle meetings, and changes to licensee status in the ROP Action Matrix. While NRC staff have access to licensees' corrective action program data and can query inspection reports on an as needed basis, this information is not currently captured and organized in a centralized NRC data system such as RRPS. Improving the consistency and quality of 95001 and 95002 inspection report data, while also leveraging technology to make this information more readily accessible to agency staff and senior management, can reduce the risk of oversight lapses¹¹ and streamline workflow for greater efficiency.

¹¹ During this audit, OIG found one case in which a PI&R inspection team only learned of completed supplemental inspection corrective actions because the licensee volunteered this information. OIG also found another case in which a licensee's corrective actions reportedly changed significantly enough over time that they no longer met the intent of the corrective actions driven by a supplemental inspection.

Recommendations

OIG recommends that the Executive Director for Operations

1. Update NRC inspection guidance to support documentation of significant planned corrective actions associated with 95001 and 95002 supplemental inspections.
2. Implement an efficient means for inspectors to readily identify and retrieve information about completed and planned corrective actions associated with 95001 and 95002 supplemental inspections.

IV. AGENCY COMMENTS

An exit conference was held with the agency on September 9, 2019. Prior to this meeting, agency management reviewed a discussion draft. 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 how NRC uses supplemental inspections to verify licensees' corrective actions, and how NRC documents supplemental inspection results.

Scope

The audit was focused on how NRC verifies licensee planned corrective actions associated with 95001 and 95002 supplemental inspections. OIG conducted this performance audit from January 2019 through July 2019 at NRC headquarters in Rockville, Maryland. Internal controls related to the audit objective were reviewed and analyzed.

Methodology

To accomplish the audit objectives, OIG reviewed relevant regulations and guidance including

- Title 10 Code of Federal Regulations, Part 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants."
- Government Accountability Office, *Standards for Internal Control in the Federal Government*.
- Inspection Procedure 95001, *Supplemental Inspection Response to Action Matrix Column 2 Inputs*, dated August 24, 2016.
- Inspection Procedure 95002, *Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area*, dated February 9, 2011.

- Inspection Procedure 95003, *Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs or One Red Input*, dated December 18, 2015.
- Inspection Procedure 71152, *Identification and Resolution of Problems*, dated February 26, 2015.
- Inspection Manual Chapter 2515, *Appendix B, Supplemental Inspection Program*, dated December 18, 2015.
- Inspection Manual Chapter 0611, *Appendix C, Guidance for Supplemental Inspection Reports*, dated December 13, 2017.
- Inspection Manual Chapter 0305, *Operating Reactor Assessment Program*, dated June 21, 2018.
- Management Directive 8.13, *Reactor Oversight Process*, dated January 16, 2018.

OIG conducted analyses to determine whether the agency uses supplemental inspections to verify planned corrective actions and document supplemental inspection results. OIG analyzed 25 95001 supplemental inspection reports issued from October 1, 2016 through December 13, 2018. Additionally, OIG interviewed NRC staff and management from the Office of Nuclear Reactor Regulation and Regional Offices to understand how the agency verifies planned corrective actions associated with 95001 and 95002 supplemental inspections.

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; Ebaide Esoimeme, Senior Auditor; Chanel Stridiron, Senior Auditor; and Tonny Tang, Auditor.

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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](#).