Audit of the U.S. Nuclear Regulatory Commission's Reactor Operator Licensing Examination Process

OIG-24-A-10

September 30, 2024

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MEMORANDUM

DATE: September 30, 2024

TO: Mirela Gavrilas
Executive Director for Operations

FROM: Hruta Virkar, CPA */RA/*
Assistant Inspector General for Audits & Evaluations

SUBJECT: AUDIT OF THE U.S. NUCLEAR REGULATORY COMMISSION'S REACTOR OPERATOR LICENSING EXAMINATION PROCESS (OIG-24-A-10)

Attached is the Office of the Inspector General's (OIG) audit report titled: *Audit of the U.S. Nuclear Regulatory Commission's Reactor Operator Licensing Examination Process*.

The report presents the results of the subject audit. On September 24, 2024, agency staff waived the exit conference, and 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.

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 301.415.1982 or Avinash Jaigobind, Team Leader, at 301.415.5402.

Attachment:
As stated

cc: J. Martin, ADO
M. Meyer, DADO
S. Miotla, DADO
J. Jolicoeur, OEDO

Results in Brief

Audit of the U.S. Nuclear Regulatory Commission's Reactor Operator Licensing Examination Process

OIG-24-A-10
September 30, 2024

Why We Did This Review

The NRC's four regional offices are responsible for issuing licenses for reactor operators and senior reactor operators of commercial nuclear power plants in accordance with the NRC's regulations in Title 10 of the Code of Federal Regulations Part 55, "Operators' Licenses."

Following the completion of a facility-administered training program, the initial licensing examination is administered. The examinations are prepared, administered, and graded using the guidance in NUREG-1021.

The audit objective was to determine the effectiveness, efficiency, and integrity of the NRC's oversight of the reactor operator licensing examination process.

What We Found

The Nuclear Regulatory Commission's (NRC) oversight of the reactor operator licensing examination process is effective, efficient, and reliable. However, the agency could benefit from providing additional guidance and clarity in the current version of NUREG-1021, "Operator Licensing Examination Standards for Power Reactors" (Rev. 12). Specifically, NUREG-1021 contains process gaps and lacks clarity in policy interpretation. This occurred because when the agency updated NUREG-1021, it did not identify certain process gaps. This lack of clarity in the guidance could lead to potential delays and errors in processing reactor operator licensing applications and in rendering requalification decisions.

What We Recommend

This report makes one recommendation to identify process gaps and update NUREG-1021 to ensure that guidance in future revisions remains current and addresses emerging issues.

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ABBREVIATIONS

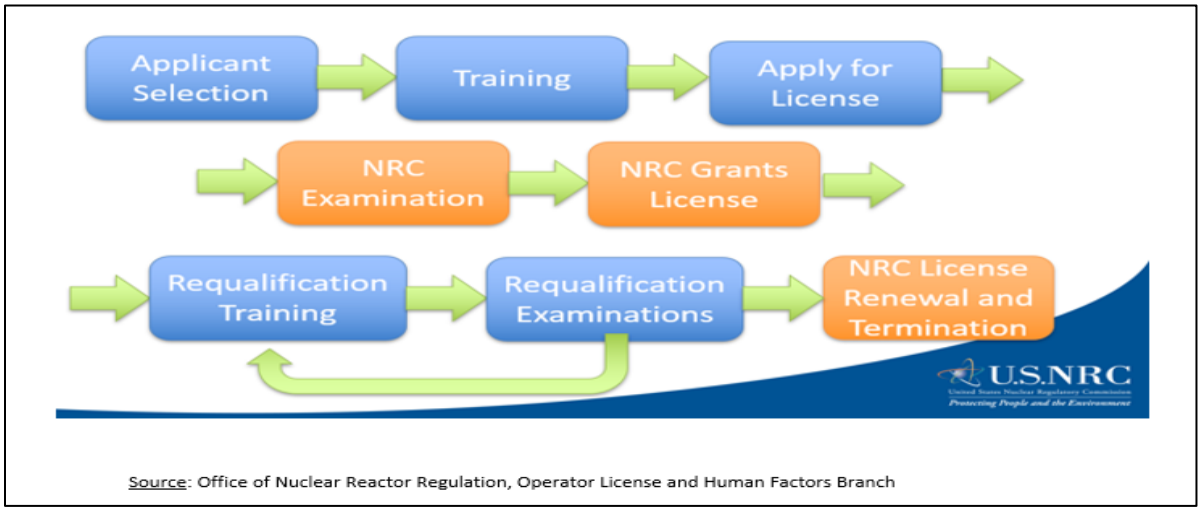
C.F.R.	Code of Federal Regulations
GAO	Government Accountability Office
GFE	General Fundamentals Examination
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OIG	Office of the Inspector General
RO	Reactor Operator
ROI	Report on Interaction
SRO	Senior Reactor Operator

I. BACKGROUND

The NRC's four regional offices are responsible for issuing licenses for reactor operators (RO) and senior reactor operators (SRO) of commercial nuclear power plants in accordance with the NRC's regulations in Title 10 of the Code of Federal Regulations (10 C.F.R.) Part 55, "Operators' Licenses." To apply for an RO or SRO license, an applicant submits a completed application, NRC Form 398, *Personal Qualification Statement--Licensee*, to the Regional Administrator responsible for overseeing the plant at which the applicant proposes working. A completed application describes the applicant's qualifications and includes the plant licensee's certification that the applicant has satisfied the licensee's training and experience requirements to be a licensed RO or SRO.

After completing the plant-administered training program, an applicant takes the initial licensing examination, which may be administered to one or more applicants at the same time. As set out in 10 C.F.R. Part 55, the initial licensing examination for ROs consists of a 75-question, multiple-choice written examination and an NRC-administered operating test that includes a plant walkthrough and a performance demonstration in the licensee's power plant simulator. SRO license applicants must pass an additional 25-question written examination and a rigorous operating test. The examinations may be written by the facility licensee and approved by the NRC, or the facility licensee may request that the NRC write the examinations. In either case, the examinations are prepared, administered, and graded using the guidance in NUREG-1021. Figure 1 describes the reactor operator licensing process.

Figure 1: Reactor Operator Licensing Process



Source: Office of Nuclear Reactor Regulation, Operator License and Human Factors Branch

Regulations and Guidance

Title 10 C.F.R. Part 55, "Operators' Licenses"

Title 10 C.F.R. Part 55 contains the regulations governing the licensing of individuals to operate nuclear reactors, including the criteria and procedures for issuing initial and renewed licenses and the conditions under which these licenses are granted. Additionally, the regulations outline the qualifications, training, and examinations required for ROs and SROs to safely and competently manage reactor operations. Further, the regulations address the responsibilities of license holders, including maintaining competence and adhering to safety protocols.

NUREG-1021, "Operator Licensing Examination Standards for Power Reactors"

NUREG-1021 helps implement 10 C.F.R. Part 55 by establishing the policies, procedures, and practices for examining applicants for RO and SRO licenses at nuclear power plants. In 2021, the NRC revised NUREG-1021 and published Revision 12 of the document, which has been in effect for initial licensing examinations scheduled on or after March 17, 2022. The NRC issued the revision to:

- streamline information into topic-based sections for ease of use;
- clarify instructions for the identification and grading of performance deficiencies on the operating test;
- revise instructions for the selection of critical tasks and the assessment of critical and significant performance deficiencies; and,
- implement changes to support the testing of fundamental topics on the site-specific initial licensing examination, in the place of a separate generic fundamentals examination (GFE).

In May 2022, the NRC established an effectiveness review team to assess the implementation of Revision 12. The team's goals are to monitor the use of the new and revised instructions, identify any additional actions needed, and evaluate the overall impact of the changes.

The review team collected data that was relevant to key tasks identified in the effectiveness review plan, including data focusing on the development, administration, and grading of initial licensing examinations. The review team also collected data regarding operator licensing program office activities such as regional Reports on Interactions (ROI), examination audits, and requests for administrative reviews. In addition, the team gathered feedback from chief examiners through post-examination questionnaires and a formal survey conducted in July 2023.

In September 2023, the review team published an interim report[1] sharing its first year's observations regarding Revision 12. In summary, the team did not observe a substantial impact on the operator licensing program resulting from the Revision 12 changes. The team continues, however, to collect data on the implementation of Revision 12, and will do so through 2027. The team will also make recommendations to improve future NUREG-1021 revisions.

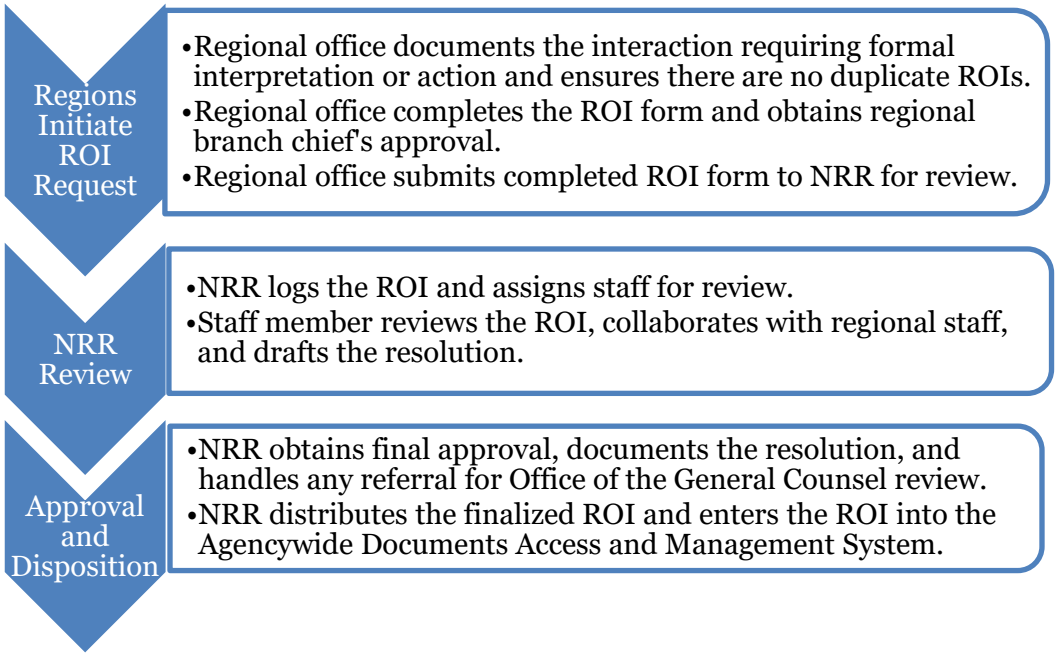
Operator License Manual Chapter 160, "Report on Interaction Process"

The NRC established the ROI process to streamline and document interactions between regional offices and the Office of Nuclear Reactor Regulation (NRR) concerning the licensing of reactor operators. These interactions frequently involve matters relating to the interpretation of policies, applicant eligibility, and other critical aspects of the operator licensing process. The primary objective of the ROI process is to ensure that new policies or modifications to existing procedures affecting operator licensing are uniformly implemented across all regional offices, with policy interpretations centrally coordinated by NRC headquarters. Additionally, the ROI process manages non-routine deferral, excusal, and waiver requests, which are reviewed and dispositioned by NRR. By formalizing these interactions, the ROI process facilitates timely and efficient information distribution, thereby helping ensure the consistent application of policies and procedures and minimizing the risk of information loss or duplication.

Figure 2 illustrates the sequential steps involved in the ROI process. This figure highlights the key stages and responsibilities, from the initiation of an ROI to its final resolution and documentation.

[1] *NUREG-1021 Revision 12 Effectiveness Review Interim Report*, dated September 2023. Agencywide Documents Access and Management System Main Library Accession No. ML23304A006

Figure 2: ROI Process Flowchart



Source: OIG Generated

Responsible Offices

Office of Nuclear Reactor Regulation

The Office of Nuclear Reactor Regulation, Division of Reactor Oversight, Operator Licensing and Human Factors Branch maintains and monitors the operator licensing program to ensure that it is effective and consistent with 10 C.F.R. Part 55, the guidance in NUREG-1021, and other policy statements. The branch helps ensure consistency in operator licensing across NRC regions by making policy decisions and providing interpretive guidance regarding non-routine decisions about individual operators. The branch also conducts comprehensive reviews regarding the implementation of regional operator licensing examination processes.

Regional Offices

The regional offices prepare and administer the initial RO licensing examination and manage the program according to the guidance provided in NUREG-1021. The regional offices are the delegated RO and SRO licensing authorities for all nuclear plants in their respective regions, with responsibility for issuing and overseeing these licenses. The regional offices

also review written examinations and operating tests prepared by the licensees or by NRC staff and provide feedback.

II. OBJECTIVE

The audit objective was to determine the effectiveness, efficiency, and integrity of the NRC's oversight of the reactor operator licensing examination process.

III. FINDING

The OIG found that the NRC provides effective, efficient, and reliable oversight of the reactor operator licensing examination process. In particular, by integrating the GFE into the reactor operator initial licensing written exam in March 2022, the NRC enhanced the operational relevance of exam questions and provided increased schedule flexibility for industry training and the NRC's National Examination Schedule. This change promoted efficiency and cost-effectiveness in the licensing process, because it reduced the resources required for developing, administering, grading, and evaluating the GFE. However, the agency could further improve the licensing process by providing additional guidance and clarity in the current version of NUREG-1021.

The NRC Should Address Process Gaps and Update NUREG-1021 to Provide Additional Guidance and Clarity

NUREG-1021, Revision 12, contains process gaps and lacks clarity in policy interpretation. The NRC should address these process gaps and update NUREG-1021 to provide additional guidance and clarity. This occurred because when the agency last updated NUREG-1021, it did not identify certain process gaps. This lack of clarity in the guidance could lead to potential delays and errors in processing operator licensing applications and rendering requalification decisions.

What Is Required

The NRC Should Establish Clear Guidance in NUREG-1021

One of the NRC's Principles of Good Regulation, "Clarity," states that regulatory requirements should be clear and understandable to all stakeholders.[2] Furthermore, the U.S. Government Accountability Office's *Standards for Internal Control in the Federal Government,*[3] states that management should design control activities, such as clear policies and procedures, to achieve objectives and respond to risks.

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

NUREG-1021, Revision 12 Contains Process Gaps and Lacks Clarity in Process Interpretation

The OIG analysis of the ROIs revealed process gaps in the current version of NUREG-1021, Revision 12. For example, the OIG reviewed 15 ROIs from January 2023 through December 2023. Of the 15 ROIs reviewed, the OIG identified four (27%) ROIs where the agency needed to update either NUREG-1021 or the required NRC Form 398 to provide additional clarity on policy matters. Figure 3 shows instances where the NRC could benefit from further refinement of, or additional clarity in, Revision 12.

[2] The five Principles of Good Regulation are Independence, Openness, Efficiency, Clarity, and Reliability. By adhering to these principles, the NRC holds itself accountable for maintaining the integrity and effectiveness of its regulatory framework, ensuring the safe use of nuclear materials, and protecting public health and safety. These principles are available under "NRC Values" on the NRC's public website.
[3] U. S. Government Accountability Office, *Standards for Internal Control in the Federal Government*, GAO-14-704G, September 2014.

Figure 3: OIG Analysis of ROIs

ROI #	What OIG Identified
2023-03	Guidance on previously established positions on providing evidence of an operator's successful manipulation of the controls existed in NUREG-1021, Revision 11, but was removed in Revision 12.
2023-09	The current version of NUREG-1021, Revision 12, failed to provide adequate guidance to NRC staff on how to proceed in reviewing license renewals when the applicant does not meet regulatory requirements for accepted reasons.
2023-10	The guidance in NUREG-1021 Examination Standard 2.2.E.3.b, *Common types of excusals*, may not be sufficient for NRC staff to use in the consistent evaluation of operator licensing examination excusal requests because past precedents cited in ROIs do not all appear to have followed NUREG-1021 guidance and were not reviewed by the NRC's Office of the General Counsel.
2023-13	No apparent guidance exists in NUREG-1021, Revision 12, Examination Standard 2.2, *Applications, Medical Requirements, and Waiver and Excusal of Examination and Test Requirements*, on the submission or review of revised or updated information on NRC Form 398. There are no visible boxes or instructions on NRC Form 398 indicating a supplement, revision, or update of previously submitted information.

Source: OIG Generated

Why This Occurred

NRC Staff Did Not Account for Certain Process Gaps

The OIG submitted its analysis of the ROIs to NRR for feedback. NRR acknowledged the OIG's analysis and stated that future NUREG-1021 revisions will be updated to account for the gaps identified by the OIG. According to NRR, gaps were present because agency staff did not identify certain process gaps when Revision 12 was adopted.

Why This Is Important

Lack of Clarity in the Guidance Could Lead to Potential Delays and Errors

The lack of clear guidance in NUREG-1021 could lead to potential delays and errors in processing reactor operator licensing applications and rendering requalification decisions. Furthermore, as stated in the NRC's *Strategic Plan,*[4] the agency strives to maintain a high standard of quality and clarity in its documents to promote confidence in the agency's work; thus, clear and updated guidance is important.

Recommendation

The OIG recommends that the Executive Director for Operations:

1.1. Identify process gaps and update NUREG-1021 to ensure that guidance in future revisions remains current and addresses emerging issues.

[4] NUREG-1641, Vol. 8, *Strategic Plan*, Fiscal Year 2022-2026

IV. NRC COMMENTS

Agency management reviewed the discussion draft version of this report and did not have comments. The NRC waived the exit conference with the OIG on September 24, 2024.

OBJECTIVE, SCOPE, AND METHODOLOGY

Objective

The audit objective was to determine the effectiveness, efficiency, and integrity of the NRC's oversight of the reactor operator licensing examination process.

Scope

This audit focused on determining if the NRC provides adequate oversight of the reactor operator licensing examination process. We conducted this performance audit at NRC headquarters in Rockville, Maryland, from October 2023 to July 2024.

Internal controls related to the audit objective were reviewed and analyzed. Specifically, the OIG reviewed the components of control environment, risk assessments, control activities, information and communication, and monitoring. Within those components, the OIG reviewed the principles of establishing structure, responsibility, and authority organizational structure; assigning responsibility and delegating authority to achieve the entity's objectives; and, designing control activities, including policies for achieving management objectives and responding to risks.

Methodology

The OIG reviewed relevant criteria for this audit, including, but not limited to:

- The Atomic Energy Act of 1954, as amended;
- U.S. Government Accountability Office, *Standards for Internal Control in the Federal Government*, GAO-14-704G, September 2014;
- Title 10 of the Code of Federal Regulations, Part 55, *Operators' Licenses*;
- U.S. NRC's *Principles of Good Regulation*;

- NUREG-1021 – *Operator Licensing Examination Standards for Power Reactors*, Revision 12; and,

- Operator License Manual Chapter -160, *Report on Interaction Process*.

The OIG interviewed various NRC employees from Headquarters, Chief Examiners, Examiners, Regional Administrators, Regional Branch Chiefs, Facility Licensees and members of the Nuclear Energy Institute focus group. In addition to these interviews, the OIG visited Region III during site validation week to observe exam security and integrity, NRC Chief Examiner(s) and facility exam team collaboration, and grading of exam Job Performance Measures and scenarios in accordance with NUREG-1021 examination standards.

The OIG reviewed the results of the evaluation effort on NRC's integration of the Generic Fundamentals Examination (GFE) into the reactor operator initial licensing written exam. This integration, initiated in response to industry feedback, allows facility licensees to write the GFE portion, reducing the number of GFEs administered annually. The initiative aims to enhance the operational relevance of exam questions and provide increased schedule flexibility for industry training and the NRC's National Examination Schedule. Additionally, this change is more efficient and cost-effective, reducing the resources required for developing, administering, grading, and evaluating the GFE.

Furthermore, the OIG reviewed ROIs submitted in the 2023 calendar year using guidance in place at the time; specifically, NUREG-1021, Revision 12, and ACAD 10-001, Revision 2. Analyses of the agency staff actions were taken to determine the consistency with which criteria present in federal laws, regulations, and agency guidance, were used as a basis for agency disposition of ROIs.

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 Avinash Jaigobind, Team Leader; Jimmy Wong, Audit Manager, Abiola Oshunleti, Senior Auditor; Lawrence Heller, Management Analyst; and William Schuster, Technical Advisor.

TO REPORT FRAUD, WASTE, OR ABUSE

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Online:	Hotline Form
Telephone:	1.800.233.3497
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Address:	U.S. Nuclear Regulatory Commission Office of the Inspector General Hotline Program Mail Stop O12-A12 11555 Rockville Pike Rockville, Maryland 20852

COMMENTS AND SUGGESTIONS

If you wish to provide comments on this report, please email the OIG using this link.

In addition, if you have suggestions for future OIG audits, please provide them using this link.

NOTICE TO NON-GOVERNMENTAL ORGANIZATIONS AND BUSINESS ENTITIES SPECIFICALLY MENTIONED IN THIS REPORT

Section 5274 of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, amended the Inspector General Act of 1978 to require OIGs to notify certain entities of OIG reports. In particular, section 5274 requires that, if an OIG specifically identifies any non-governmental organization (NGO) or business entity (BE) in an audit or other non-investigative report, the OIG must notify the NGO or BE that it has 30 days from the date of the report's publication to review the report and, if it chooses, submit a written response that clarifies or provides additional context for each instance within the report in which the NGO or BE is specifically identified.

If you are an NGO or BE that has been specifically identified in this report and you believe you have not been otherwise notified of the report's availability, please be aware that under section 5274 such an NGO or BE may provide a written response to this report no later than 30 days from the report's publication date. Any response you provide will be appended to the published report as it appears on our public website, assuming your response is within the scope of section 5274. Please note, however, that the OIG may decline to append to the report any response, or portion of a response, that goes beyond the scope of the response provided for by section 5274. Additionally, the OIG will review each response to determine whether it should be redacted in accordance with applicable laws, rules, and policies before we post the response to our public website.

Please send any response via email using this link. Questions regarding the opportunity to respond should also be directed to this same address.