



# OFFICE OF THE INSPECTOR GENERAL

U.S. NUCLEAR REGULATORY COMMISSION

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

## Audit of NRC's Operator Licensing Program for the AP1000 Power Reactor

OIG-16-A-08

February 8, 2016



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

**OFFICE OF THE  
INSPECTOR GENERAL**

February 8, 2016

MEMORANDUM TO: Victor M. McCree  
Executive Director for Operations

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

SUBJECT: AUDIT OF NRC'S OPERATOR LICENSING PROGRAM  
FOR THE AP1000 POWER REACTOR (OIG-16-A-08)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of NRC's Operator Licensing Program for the AP1000 Power Reactor*.

The report presents the results of the subject audit. Following the January 19, 2016, 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 Paul Rades, Team Leader, at (301) 415-6228.

Attachment: As stated



# Office of the Inspector General

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

OIG-16-A-08

February 8, 2016

## Results in Brief

### Why We Did This Review

The U.S. Nuclear Regulatory Commission (NRC) licenses the individuals who operate the controls or supervise operation of commercial nuclear power reactors. Before NRC licenses someone to operate controls of a commercial nuclear power reactor, this individual must complete extensive training and pass rigorous, site-specific written examinations and operating tests that are relevant to the design and construction of the facility they will operate.

Four Advanced Passive 1000 (AP1000) Pressurized Water Reactors are under construction, two at Virgil C. Summer Nuclear Station in South Carolina and two at Vogtle Electric Generating Plant in Georgia. This is a new reactor design for which operators have never been licensed. An operator's license authorizes the license holder to manipulate the controls of the facility, which directly affect the reactivity or power level of the reactor. By the year 2020, approximately 70 licensed operators will be needed for the AP1000.

The audit objective was to determine if NRC's program for licensing AP1000 reactor operators is efficiently and effectively implemented.

### *Audit of NRC's Operator Licensing Program for the AP1000 Power Reactor*

#### What We Found

The efficiency and effectiveness in NRC's licensing of AP1000 reactor operators can be improved. Key questions concerning the new reactor operator licensing requirements governing the time interval between administration of the written examination and operating test are currently unresolved. Additionally, requirements for qualifying new simulators for use during the AP1000 operating test are unclear. In the meantime, one of the AP1000 licensees has administered the written exam to its operator candidates without having a simulator approved for use in the operating test.

These program weaknesses have occurred because NRC management and staff responsible for licensing operators have held differing interpretations of regulations and guidance pertaining to the AP1000 operator licensing process, and have left key decisions related to examination timing and simulator requirements undocumented.

#### What We Recommend

This report makes recommendations to strengthen processes for the AP1000 operator licensing program. Agency management stated their agreement with the finding and recommendations in this report.

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## TABLE OF CONTENTS

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<a href="#"><u>ABBREVIATIONS AND ACRONYMS</u></a> .....	i
I. <a href="#"><u>BACKGROUND</u></a> .....	1
II. <a href="#"><u>OBJECTIVE</u></a> .....	5
III. <a href="#"><u>FINDING</u></a> .....	5
<a href="#"><u>Efficiency and Effectiveness in NRC's Licensing of AP1000</u></a> <a href="#"><u>Reactor Operators Can Be Improved</u></a> .....	5
<a href="#"><u>Recommendations</u></a> .....	13
IV. <a href="#"><u>AGENCY COMMENTS</u></a> .....	14
 <b>APPENDIX</b>	
<a href="#"><u>OBJECTIVE, SCOPE, AND METHODOLOGY</u></a> .....	15
 <a href="#"><u>TO REPORT FRAUD, WASTE, OR ABUSE</u></a> .....	17
 <a href="#"><u>COMMENTS AND SUGGESTIONS</u></a> .....	17

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## **ABBREVIATIONS AND ACRONYMS**

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AP1000	Advanced Passive 1000
CFR	Code of Federal Regulations
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRO	Office of New Reactors
NRR	Office of Nuclear Reactor Regulation
OIG	Office of the Inspector General



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## I. BACKGROUND

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The U.S. Nuclear Regulatory Commission (NRC) licenses the individuals who operate the controls of commercial nuclear power reactors. Operator licenses are issued contingent upon, among other things, the individuals passing examinations that demonstrate their competency to operate a particular type of reactor. An operator's license authorizes the license holder to manipulate the controls of the facility, including mechanisms which directly affect the reactivity or power level of the reactor. A senior operator's license authorizes the license holder to manipulate the reactor power controls and to direct the licensed activities of licensed operators.

Four Advanced Passive 1000 (AP1000) Pressurized Water Reactors are under construction, two at Virgil C. Summer Nuclear Station in South Carolina and two at Vogtle Electric Generating Plant in Georgia. This is a new reactor design for which operators have never been licensed. A minimum of 70<sup>1</sup> AP1000 reactor operators will be required to operate the new reactors when they are completed. Although the facility licensees initially projected a need for licensed operators to work at the new sites in the 2016-2018 timeframe, it is now estimated the new reactors will not be completed until the 2019-2020 timeframe.

### **AP1000 Operator Licensing**

Before NRC licenses someone to operate or supervise operation of the controls of a commercial nuclear power reactor, this individual must complete extensive training and pass rigorous, site-specific written examinations and operating tests that are relevant to the design and construction of the facility they will operate. The written exam is typically administered by the facility licensee and the operating tests are administered by NRC.

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<sup>1</sup> The total number of licensed operators needed is based on license requirements for a minimum of 7 qualified licensed operators per shift on 5 separate shift crews, totaling 35 per licensee or 70 total for the four AP1000 units under construction.

- The written examination tests the applicant's technical knowledge required to operate the reactor and consists of 75 multiple-choice questions. To become a senior operator, one must pass an additional 25-question written examination and a more rigorous operating examination.
- The operating test requires the applicant to demonstrate an understanding of and the ability to perform the actions necessary to accomplish a representative sample of 13 items listed in Federal regulations. For new AP1000 reactors, the operating test will be administered in a plant walkthrough and in either (1) a simulation facility that NRC has approved for use after an application has been made by the facility licensee under regulatory requirements or (2) a plant-referenced simulator. If the plant-referenced simulator is used, it must be designed and implemented so that it is sufficient in scope and fidelity to the reference plant<sup>2</sup> for the testing purposes described in Federal regulations. The plant walk-through portion of the operating test is conducted using an evaluation tool called job performance measures. These measures are based on tasks contained in the facility's job and task analyses requiring the applicant to perform (or simulate) a task that is applicable to the license level (reactor operator or senior reactor operator) of the examination.

### **Applicable Laws, Regulations, and Guidance**

Collectively, specific Federal laws, regulations and NRC guidance describe the operator licensing regime that is applicable to commercial nuclear power reactors licensed in the United States.

At the highest level, Section 107 of the Atomic Energy Act of 1954, as Amended, states, "The Commission shall prescribe uniform conditions for licensing individuals as operators of any of the various classes of production and utilization facilities licensed in [Chapter 10 of the Act]." Also, Section 306 of the Nuclear Waste Policy Act of 1982 authorizes and directs NRC to promulgate regulations, or other appropriate Commission regulatory guidance, for the training and qualification of civilian nuclear

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<sup>2</sup> "Reference plant" means the specific nuclear power plant from which a simulation facility's control room configuration, system control arrangement, and design data are derived.

power plant operators, supervisors, technicians, and other appropriate operating personnel.

To implement these laws, Title 10, *Energy of the Code of Federal Regulations* (10 CFR) Part 55, "Operators' Licenses," provides regulations for the licensing of nuclear power reactor operators and senior reactor operators. Among other things, 10 CFR Part 55 mandates that the criteria, *Operator Licensing Examination Standards for Power Reactors* (NUREG-1021), be used to prepare and evaluate the written examination and operating tests. NUREG-1021 establishes NRC's policies, procedures, and practices for administering the required initial and requalification written exams and operating tests. These guidance standards are intended to ensure the equitable and consistent administration of examinations for all applicants.

## **NRC Headquarters and Regional Office Operator Licensing Responsibilities**

### NRC Headquarters

NRC's headquarters-based Office of New Reactors (NRO) is responsible for the licensing and oversight of new commercial nuclear power reactors. Within NRO, the Division of Construction Inspection and Operational Programs develops policies and guidance for the licensing of new nuclear reactor operators. NRO coordinates with other headquarters and NRC regional offices on operator licensing program implementation.

Elsewhere at headquarters, the Office of Nuclear Reactor Regulation's (NRR) Operator Licensing and Training Branch is responsible for the oversight of training and licensing the operators of nuclear power reactors at existing commercial nuclear facilities. In addition, the Office of the General Counsel provides legal advice and assistance to NRC staff on all aspects of licensing reactors, reactor operators, and senior reactor operators.

### NRC Region II

The Director of NRO has delegated to the Region II Regional Administrator, authority and responsibility, under 10 CFR Part 55, for the issuance and renewal of licenses for operators and senior operators of



nuclear power reactors (located in Region II) licensed under 10 CFR Part 50 or Part 52.

Accordingly, NRC's Region II office, located in Atlanta, Georgia, is responsible for the issuance and renewal of licenses for operators and senior operators for the V.C. Summer and Vogtle AP1000 power reactors. Key regional officials or offices in new reactor operator licensing are as follows:

- The Region II Regional Administrator is responsible for implementing established NRC policies and programs relating to inspection and licensing for operations and construction inspection program activities for reactors. Any application for an operator's license must be submitted to the Regional Administrator. In turn, the Regional Administrator or a designee will transmit to the NRO Director or NRR Director, as appropriate, any matter outside the scope of the Regional Administrator's delegated authority.
- The Region II Division of Reactor Safety is primarily responsible for overseeing AP1000 power reactor operator licensing at both V.C. Summer and Vogtle, including the preparation of AP1000 examinations and inspections.
- The Region II Regional Counsel is responsible for advising the Regional Administrator and staff on interpreting the regulations and guidance applicable to operator licensing.

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## II. OBJECTIVE

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The audit objective was to determine if NRC's program for licensing AP1000 reactor operators is efficiently and effectively implemented. The report appendix contains information on the audit scope and methodology.

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## III. FINDING

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### **Efficiency and Effectiveness in NRC's Licensing of AP1000 Reactor Operators Can Be Improved**

NRC's Principles of Good Regulation call for timely, effective regulation that, once established, should be perceived to be reliable and not unjustifiably in a state of transition. However, key questions concerning the new reactor operator licensing requirements governing the time interval between administration of the written examination and operating test are unresolved. Furthermore, the requirements for qualifying simulators for use during the operating test are unclear. These program weaknesses have occurred because NRC management and staff responsible for licensing operators have differing interpretations of regulations and guidance, and have left key decisions undocumented. If not corrected, the agency's ability to fully meet future new reactor operator licensing requirements could be challenged.

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

#### **Timely and Effective Regulatory Requirements**

NRC programs should be implemented efficiently and effectively. According to NRC's Principles of Good Regulation, regulatory decisions should be made without undue delay, and final decisions must be based on objective, unbiased assessments of all information, and must be documented with reasons explicitly stated. The Principles of Good

Regulation further state that, once established, regulation should be perceived to be reliable and not unjustifiably in a state of transition. Regulatory actions should always be fully consistent with written regulations and should be promptly, fairly, and decisively administered to lend stability to NRC's nuclear operational and planning processes.

## ***What We Found***

### **AP1000 Examination Interval Requirements Are Unresolved and Simulator Requirements Are Unclear**

Questions concerning NRC's requirements governing the time interval between the written examination and operating test administration for the AP1000 facilities currently under construction in Region II are not resolved. Furthermore, the requirements to qualify simulators as Commission-approved simulation facilities for use during operating tests for new reactor operator licensing for the AP1000 facilities are unclear. In the meantime, one of the AP1000 licensees has administered the written exam to its operator candidates without having a simulator approved for use in the operating test.

#### Examination Timing Requirements Not Resolved

NRC staff have not resolved an outstanding issue related to the time interval between the written examination and operating test administration for the AP1000 facilities currently under construction.

NUREG-1021 describes how to administer operating tests to initial license applicants in accordance with the requirements of 10 CFR 55.45. To this end, the NUREG states that the operating test should normally be administered within 30 days before or after the written examinations.<sup>3</sup> The 30-day requirement reflects the importance for applicants to take the written exam and operating test within a reasonable interval to enhance efficiency and maintain examination security. Additionally, NRC staff

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<sup>3</sup> NUREG-1021, specifically Examination Standard 302, describes how to administer operating tests to initial license applicants in accordance with the requirements of 10 CFR 55.45, "Operating tests." It includes policies and guidelines for administering both the walkthrough and integrated plant operations portions of the operating test.

noted that it is important to conduct exams in a timely manner so that eligible applicants retain their relevant skills and abilities, and the examinations capture an accurate reflection of the individual's knowledge and skills. Further, the examinations should be conducted in a manner that ensures uniform conditions for administration of the examination process per the Atomic Energy Act and NUREG-1021.

As early as the 2007-2009 timeframe, the industry and NRC identified the need to promote effective, efficient, and consistent preparation for licensing operators of new plants under construction such as the AP1000. In 2009, the Nuclear Energy Institute (NEI)<sup>4</sup> published NEI 06-13A, *Template for an Industry Training Program*, which acknowledged that parts of the operating test cannot be carried out per existing guidance because the plants are under construction and the plant design is not final. This view was supported by results of NRC's public meetings with the industry in 2007 regarding operator licensing challenges. Normally, as explained in NUREG-1021, the operating tests should be administered within 30 days before or after the written examinations. It was during these meetings that NRC and the industry discussed the possibility of allowing waivers that would permit portions of the operating test to be administered beyond the normal 30-day timeframe called for in NUREG-1021.

These concerns came to fruition in 2015 when one of the AP1000 facility licensees indicated that it would like to proceed with an initial set of written operator licensing examinations. On March 6, 2015, Region II sought program office direction for several items related to the administration of AP1000 examinations. Specifically, Region II recommended that passed portions of the exam administered to be used for licensing decisions for at least one year measured from the first test item. NRO and NRR approved Region II's request for a small portion of the operating test to diverge from the normal "within 30 days before or after the written examinations" timeframe based on the status of plant completion as originally envisaged by NRC and the licensees. However, Region II staff concluded that a simulator would not be ready for conducting the operating test.<sup>5</sup>

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<sup>4</sup> NEI is an organization composed of nuclear industry representatives whose stated mission is to foster the beneficial uses of nuclear technology before Congress, the White House, and executive branch agencies; Federal regulators; and State policy forums.

<sup>5</sup> V.C. Summer formally requested to use an alternative simulator (Commission-approved simulator) in the operator licensing test in January 2015. In April 2015, Region II led inspections of AP1000 simulators,

Subsequently, on May 11, 2015, Region II sought headquarters approval to administer all of the operating test examination dates that diverge by more than 30 days from the written examination. Further, Region II requested that headquarters determine the timeline in which an AP1000 operator licensing examination must be completed in its entirety.

Soon thereafter, the licensee submitted—and Region II accepted, in part—14 licensee applications for taking the written operator licensing examination. NRC indicated that permissions to allow the exams to diverge more than 30 days were pending further evaluation. The written exams for these applicants were administered the following day, on May 22, 2015. NRC informed the facility licensee that because the facility licensee's request to deviate from the 30-day timeframe was unresolved, the applicants would be taking the examination at risk. That is, if the 30-day request was not ultimately approved, the exam would have to be retaken at a later date. As of the end of audit fieldwork, NRC was still working to resolve the request to allow the operating test to occur beyond the 30-day timeframe.

#### Simulator Requirements Unclear

The requirements to qualify a simulator as a Commission-approved simulation facility for use in AP1000 operating tests are unclear. For currently built and operating reactors, reactor operator candidates generally perform their operating tests on a plant-referenced simulator. According to 10 CFR Part 55 and NRC guidance, a plant-referenced simulator reflects the as-built design of the reactor.<sup>6</sup> At face value, meeting these requirements on a proposed AP1000 reactor plant-referenced simulator is currently a challenge because these reactors are undergoing construction using control room designs that the licensees are still implementing and validating using an NRC-approved process. NRC conducted inspections of AP1000 simulators and ultimately determined a plant-referenced simulator would not be ready in time for the operating tests scheduled for later in 2015. Consequently, the AP1000 licensees

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both at V.C. Summer Units 2 and 3 and at Vogtle Units 3 and 4. The April 2015 simulator inspection was one input into the NRO decision on whether or not a Commission-approved simulator would be approved at V.C. Summer.

<sup>6</sup> 10 CFR 55.46(c) states, in part, that a plant-referenced simulator used for the administration of the operating test must demonstrate expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond.

requested to administer the operating test with a Commission-approved simulator.

However, incomplete licensee implementation and validation of the control room design and a lack of clear written requirements for a Commission-approved simulator has resulted in difficulties in approving a simulation facility. The requirements—stipulated in 10 CFR 55.46(b), “Commission-approved simulation facilities and Commission approval of use of the plant in the administration of the operating test,”—are general in nature and not as specific as those for a plant-referenced simulator. In an attempt to clarify what technical information was needed to complete the safety review of the licensee’s proposed simulation facility, NRC conducted five public meetings with the licensee. Despite the licensee’s efforts to provide three sets of supplemental information to the agency, in July 2015, the NRC suspended its detailed safety review of the proposed Commission-approved simulator due to lack of sufficient licensee data and justification for staff approval.

NRC staff indicated that the licensee’s efforts to communicate with NRC and to provide multiple sets of supplemental information indicates the licensee was unclear about the Commission-approved simulator requirements. A senior manager for this facility corroborated their confusion, but also indicated the Commission-approved simulator approval requirements were sometimes hard to distinguish from plant-referenced simulator requirements because of a lack of clear guidance.

### ***Why This Occurred***

#### **Differing Interpretations of Regulations and Guidance and Undocumented Key Decisions**

The lack of resolution and clarity for AP1000 operator licensing requirements has occurred because NRC management responsible for licensing AP1000 operators (1) have differing interpretations of regulations and guidance and (2) have not documented key decisions.



### Differing Interpretations of Regulations and Guidance

Organizations within NRC have differing interpretations of how to implement existing regulations and guidance pertaining to the AP1000 operator licensing process. In particular, headquarters and regional staff have not agreed on the extent to which existing regulations and guidance allow the NRO program office to grant permission for exceeding the 30-day examination time interval. According to NRC management and staff, the fundamental disagreement is whether evolving developments associated with AP1000 operator licensing, including the status of licensee simulation facilities, justify requests to exceed the examination time interval in NUREG-1021 and, if so, under what conditions.

### Key Decisions Not Officially Documented

NRC management has not officially documented all operator licensing key decisions related to examination timing and simulator requirements. NRO and NRR guidance<sup>7</sup> notes there may be circumstances that represent a significant departure from the way existing plants were licensed or involve special or unique features that are not well covered by current regulatory guidance. In such cases, agency guidance specifies that differing positions or approaches may need to be articulated in writing so agency staff can have an indepth understanding of the position being considered.

However, NRC management used meetings and emails to communicate and determine key decisions associated with AP1000 operator licensing issues. The outcomes of these meetings in most cases were not formally documented, with much of the record remaining anecdotal, unverifiable, and difficult to reconstruct. For example, NRC has no official record of the NRC's staff position against examination date divergence beyond 30 days. Additionally, staff told OIG that headquarters and the region did not agree about the outcome of discussions relating to simulator requirements. For example, there was continued misunderstanding between headquarters and regional staff about whether enough had been done to approve a plant-referenced simulator.

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<sup>7</sup> COM-114 (NRR) / COM-105 (NRO), Revision 2, *Protocol to Ensure Appropriate Technical, Regulatory, and Policy Consistency Between the Office of Nuclear Reactor Regulation and the Office of New Reactors*, December 23, 2011.

Meetings intended to resolve outstanding questions about exam timing or simulator requirements were not officially documented and often did not achieve desired results. Headquarters and regional staff indicated that staff positions often did not come into alignment even after NRC senior managers had meetings to resolve AP1000 operator licensing issues. Although staff appeared to reach consensus during meetings, some staff explained that after meetings intended to resolve disagreements over examination timing and simulator requirements, individuals continued to advocate for their previously held positions. A manager stated that during one meeting, apart from agreeing to do more to address existing problems relating to exam timing and simulator requirements, no specific decisions were made. In contrast, a senior NRC manager expressed confidence that meetings and discussions were identifying an appropriate course the agency would adopt and that no one should feel they are always correct on a given matter.

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

#### **AP1000 Operator Licensing Program Could Face Implementation Challenges**

If not corrected, the identified AP1000 operator licensing program implementation problems could challenge the agency in the following areas:

- Weaknesses in simulator fidelity.
- Continued miscommunication and poor coordination between regional and headquarters staff.
- Negative impact on existing and new reactor projects.

#### **Weaknesses in Simulator Fidelity**

Given the importance of simulator fidelity to the operating plant design for the purposes of training operator applicants, an improperly programmed training simulator could adversely affect the efficacy of licensed operator training. For example, NRC inspectors attributed errors made by Entergy operators when responding to a 2014 emergency shutdown at River Bend nuclear site partly to the training simulator. NRC found the facility was in violation of NRC requirements because a training simulator did not

accurately reproduce the conditions that control room operators faced. An NRC spokesman noted, "When the plant shut down unexpectedly, they were faced with issues they hadn't practiced on the simulator."

#### Continued Miscommunication and Poor Coordination Between Regional and Headquarters Staff

The inability to find common ground on regulations and guidance, combined with undocumented key decisions, has contributed to poor communication and coordination between NRO and Region II. Regional and headquarters staff have indicated that communication and coordination has not been ideal. One headquarters official said there was a lack of cooperation with Region II and that the region had been put in a bad position; another senior headquarters official asserted there was a reluctance to write things down and discussions were not being documented. Other officials stated that communications with Region II used to be good, but now it appeared the region was interpreting regulations and guidance their own way and was not taking into account NRO input. As a result, the region and headquarters could continue to hold divergent positions on key issues.

#### Potential Impact to Operator Licensing Program for Existing and New Reactor Projects

Given that operator licensing for both currently operating reactors and new reactors currently under construction are governed by the same regulations and guidance, any emerging interpretations and guidance changes made for AP1000 operator licensing have the potential to significantly impact operator licensing for currently operating reactors.

For example, if the examination timing issue is not addressed clearly and decisively for AP1000 facilities, then a new precedent may be set, allowing examination dates to diverge by more than 30 days without an articulated justification. This would add new potential challenges to meeting Section 107 of the Atomic Energy Act, which calls for uniform administration of the operator licensing examination process.

Identified issues with communication, coordination, and formal documentation of key decisions pose additional problems. For example, future managers and staff who are new to AP1000 operator licensing

issues will be unfamiliar with the history of the AP1000 operator licensing process—and could be put in the position of having to make decisions based on informal or incomplete information.

Finally, failure to address the aforementioned problems in a timely and complete way could adversely impact licensee and public confidence in NRC's oversight of both current operator licensing programs and future licensing programs such as for Small Modular Reactors.

### **Recommendations**

OIG recommends that the Executive Director for Operations

1. Develop and implement an agencywide, consistent interpretation of regulations and guidance to address issues specific to new reactor operator licensing requirements.
2. Implement staff processes for documenting, addressing, communicating, and monitoring key decisions relevant to new reactor operator licensing requirements.

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## **IV. AGENCY COMMENTS**

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An exit conference was held with the agency on January 19, 2016. 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 agreement with the finding and recommendations in this report and opted not to provide formal comments for inclusion in this report.

## Appendix

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### OBJECTIVE, SCOPE, AND METHODOLOGY

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#### Objective

The audit objective was to determine if NRC's program for licensing AP1000 reactor operators is efficiently and effectively implemented.

#### Scope

This audit focused on evaluating the efficiency and effectiveness of NRC's AP1000 operator licensing program. We conducted this performance audit from June 2015 through October 2015 at NRC headquarters in Rockville, MD, through interviews, telephone, and emails. Auditors interviewed staff from the Office of the Commission, Office of New Reactors, Office of Nuclear Reactor Regulation, Office of the General Counsel, and Region II operator licensing staff and licensee staff. Internal controls related to the audit objective were reviewed and analyzed. Throughout the audit, auditors were aware of the possibility of fraud, waste, and abuse in the program.

#### Methodology

To address the audit objective within the scope of this audit, OIG auditors reviewed the following Federal and agency guidance, key data, and documents:

- *Atomic Energy Act of 1954*, as Amended.
- *Nuclear Waste Policy Act of 1982*, as Amended.
- 10 *Code of Federal Regulations* Part 55, "Operators' Licenses," January 2004.
- Government Accountability Office, *Standards for Internal Control in the Federal Government*, September 2014.
- *NRC Principles of Good Regulation*.
- *American National Standards Institute/ American Nuclear Society ANSI/ANS-3.5-1998*, "Nuclear Power Plant Simulators For Use in Operator Training and Examination," April 1998.



- *Regulatory Guide 1.149, Revision 4, "Nuclear Power Plant Simulation Facilities for Use in Operator Training, License Examinations, and Applicant Experience Requirements,"* April 2011.
- NRC Inspection Manual Chapters.
- NRC Inspection Procedures.
- NUREG-1021, Revision 10 - *Operator Licensing Examination Standards for Power Reactors*, December 2014.
- NUREG-2103, *Knowledge and Abilities Catalog for Nuclear Power Plant Operators - Westinghouse AP1000* (Draft for Comment), October 2011.
- Final Safety Analysis Report, Vogtle, June 2011.
- Final Safety Analysis Report, V. C. Summer, June 2011.
- Nuclear Energy Institute (NEI) 06-13A, Revision 2, *Template for an Industry Training Program*, March 2009.
- COM-114 (NRR)/COM-105 (NRO), Revision 2, *Protocol to Ensure Appropriate Technical, Regulatory, and Policy Consistency Between the Office of Nuclear Reactor Regulation and the Office of New Reactors*, December 2011.

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.

The audit was conducted by RK Wild, Team Leader; Paul Rades, Team Leader; Vicki Foster, Audit Manager; Kevin Nietmann, Senior Technical Advisor; John Thorp, Senior Technical Advisor; Timothy Wilson, Senior Management Analyst; Larry Vaught, Senior Auditor; Jenny Cheung, Auditor; and Janelle Wiggs, Auditor.

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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](#).