



POLICY ISSUE **(Information)**

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FOR: The Commissioners

FROM: Daniel H. Dorman
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SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR
CALENDAR YEAR 2022

PURPOSE:

The purpose of this paper is to present the results of the U.S. Nuclear Regulatory Commission (NRC) staff's annual self-assessment of the Reactor Oversight Process (ROP) and the Construction ROP (cROP) for calendar year (CY) 2022. The staff conducted the CY 2022 self-assessment of the ROP in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," dated May 3, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21341B399), and its appendices. This paper does not address any new commitments or resource implications.

SUMMARY:

The results of the CY 2022 ROP self-assessment show that the ROP is effective in achieving the goals of being objective, risk-informed, understandable, and predictable, as well as in supporting the agency's strategic goals. The staff performed a full ROP self-assessment for CY 2022, which consisted of ROP performance metrics and data trending, ROP program area evaluations, an ROP implementation audit, effectiveness reviews, the ROP lessons learned tracker, and baseline inspection program routine monitoring. The ROP self-assessment

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program actively seeks feedback from all stakeholders, both internal and external, with the goal of continuously improving the ROP. This paper also discusses related ongoing ROP and cROP activities.

BACKGROUND:

The ROP is the NRC's program to inspect, monitor, and assess the safety and security performance of operating commercial nuclear power plants and to respond to any declines in performance. The ROP self-assessment program is designed to evaluate ROP effectiveness in reaching the goals of being objective, risk-informed, understandable, and predictable, as well as in supporting the agency's strategic goals as delineated in NUREG-1614, Volume 8, "Strategic Plan: Fiscal Years 2022–2026," issued April 2022 (ML22067A170): to ensure the safe and secure use of radioactive materials, to continue to foster a healthy organization, and to inspire stakeholder confidence in the NRC.

The ROP self-assessment program provides timely and objective information to inform program planning and to develop recommended improvements to the ROP. The ROP self-assessment program includes an annual CY assessment. Both NUREG-2251, Volume 1, "Capacity Assessment For Statistics, Research, Evaluation, and Other Analysis: Fiscal Year 2022," issued April 2022 (ML22066B054), and the "Evidence Building and Evaluation Fiscal Year 2022 Annual Evaluation Plan" (ML21053A191) identify the annual self-assessment of the ROP as a significant evidence-building activity for the agency.

The staff conducted the CY 2022 ROP self-assessment using IMC 0307, and IMC 0307, Appendices A, B, C, and D (ML19274C401, ML22117A010, ML19274C225, and ML19045A287, respectively). The ROP self-assessment approach consists of three distinct elements as described in IMC 0307. Element 1 measures regional and headquarters program effectiveness and uniformity in implementing the ROP; Element 2 assesses the effectiveness of recent ROP changes and evaluates the NRC's response to significant licensee events or declining licensee performance; and Element 3 performs focused assessments of specific ROP program areas, including the baseline inspection program.

DISCUSSION:

The results of the CY 2022 self-assessment show that the ROP is effective in achieving its program goals. The discussion below, categorized by ROP self-assessment program element, details the CY 2022 ROP self-assessment results. A summary of related ongoing ROP activities follows the ROP self-assessment results.

Element 1: Measure Regional and Headquarters Program Effectiveness and Uniformity in Implementing the ROP

ROP Performance Metrics

The staff measured the effectiveness of, and adherence to, the current ROP program using objective metrics as described in IMC 0307, Appendix A, "Reactor Oversight Process Self-Assessment Metrics and Data Trending," dated May 29, 2020. The ROP metrics are grouped according to the NRC's Principles of Good Regulation (independence, openness, efficiency, clarity, and reliability).

IMC 0307 uses a graded approach for measuring ROP performance, with each metric in Appendix A having three designated possible outcomes: green, yellow, or red. If a metric is

green, it meets or exceeds expected performance; if yellow, it warrants further evaluation and potential staff action to correct; and if red, it represents unexpected performance and merits further evaluation and likely staff action to address the cause.

The ROP performance metric report for CY 2022, dated March 9, 2023 (package ML23066A204), provides detailed data and staff analysis for each ROP metric. The staff found that 13 of 17 evaluated ROP metrics were green for CY 2022. The staff did not evaluate ROP metric O-4, "Reporting and Dissemination of Performance Indicator (PI) Data" for CY 2022 due to the current version of the metric not being meaningful because of overall improvements in the PI data posting process; a complete discussion of this metric can be found in the ROP performance metric report, and this metric is briefly discussed under "Performance Indicator Program" in the enclosure. The ROP performance metrics that were evaluated as yellow or red are discussed individually below.

In CY 2022, as in CYs 2020 and 2021, the Coronavirus Disease 2019 (COVID-19) public health emergency (PHE) continued to have an impact on ROP implementation, but as discussed in more detail in the section "Status of the ROP and Lessons Learned During the COVID-19 PHE," the staff's intent for CY 2022 was to prioritize onsite inspection activities. This impact is also seen in the results for the CY 2022 ROP performance metrics. Two ROP metrics (I-3 and I-4), which are described in subsequent paragraphs in this section, were previously evaluated by the staff as red in CYs 2020 and 2021 and were again evaluated by the staff as red in CY 2022.

Typically, a yellow or red metric warrants further evaluation and possible or likely staff action to correct. However, in the case of these two metrics, since these metric results have improved significantly relative to CYs 2020 and 2021, the staff does not plan to take action while there are still measurable impacts from the COVID-19 PHE. The staff has reviewed these metrics and their results to determine whether other contributing factors unrelated to the COVID-19 PHE could be contributing to undesirable performance results. The staff continues to be confident that the current agency oversight actions are meeting the agency's strategic goals.

ROP metric I-3, "Inspector Objectivity and Performance Reviews," measures whether line managers perform annual objectivity reviews of each fully qualified inspector in an inspection branch in accordance with IMC 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities," dated April 24, 2013 (ML12012A053). For this metric in CY 2022, 8 of 294 qualified inspectors did not have an annual IMC 0102 objectivity review; 6 qualified inspectors received a virtual objectivity review while performing virtual interactions with a licensee, which met the intent of the IMC 0102 requirements; and 280 inspectors received an in-person objectivity review. This is a significant improvement from CY 2020 and CY 2021 when 91 of 329 and 38 of 300, respectively, did not have an annual objectivity review. Since six or more inspectors did not have an annual objectivity review, this metric is red as it was in CY 2020 and CY 2021.

ROP metric I-4, "Fully Qualified Inspectors, Examiners, and Senior Risk Analysts," measures whether staff members remain fully qualified in accordance with IMC 1245, "Qualification Program for Reactor Inspectors," dated June 7, 2022 (ML22033A204), and the corresponding appendices. For this metric in CY 2022, all four regional offices had several staff members who were not able to complete post qualification or refresher training. Since six or more staff members did not remain fully qualified in accordance with qualification requirements this metric is red as it was in CY 2020 and CY 2021. All but one of these staff members have been able to schedule their required training for CY 2023. On December 16, 2020, the Division of Reactor Oversight (DRO) initially revised IMC 1245, Appendix D1, "Maintaining Qualifications,"

(ML20246G611) to authorize a one-time deviation for applicable refresher training requirements due to the COVID-19 PHE. The current revision of IMC 1245, Appendix D1, dated January 23, 2023 (ML23018A031) further states that this COVID-19 related deviation will end at the end of CY 2023 and all refresher training requirements will be in full effect in CY 2024. Even with this deviation still in effect through CY 2023, ROP metric I-4 specifically counts approved deviations as instances of not meeting this metric.

ROP metric I-5, "Continuity of RI/SRI Site Staffing," measures whether inspector staffing levels are maintained to provide continuity of regulatory oversight at each reactor site. For this metric in CY 2022, the overall resident inspector (RI) staffing percentage for the agency was 93.3 percent; 14 of 54 individual reactor sites fell below the 90 percent metric threshold. Since the staffing percentage for the agency is less than 95 percent but greater than or equal to 90 percent, this metric is yellow. The results for this metric are due to a combination of factors, including staffing challenges associated with placing permanent RIs, not having sufficient number of inspector-qualified staff to provide a backfill during gaps between permanent RIs, and only having staff available for short term (i.e., less than 6 weeks) site coverage. RI staffing continues to be an area of agency focus, as discussed further in the "Resident Inspector Recruitment and Retention" section of this paper. Based on regional feedback, the staff has evaluated and intends to revise this metric in CY 2023. Additional details are provided in the enclosure to this paper. The staff will continue to monitor and report on RI site staffing levels, while continuing to focus holistically on RI recruitment and retention challenges.

ROP metric E-3, "SDP Completion Timeliness for Potentially Greater-than-Green Findings," measures whether potentially greater-than-green (GTG) findings have a final significance determination issued within 255 days of identification. This metric applies to all findings in which the staff transmits to the licensee a preliminary determination that a finding is potentially GTG, regardless of the final determination of that finding and its significance. In CY 2022, the staff issued nine final significance determinations subject to this metric, three of which exceeded the timeliness goal. Since three findings were not finalized within 255 days, this metric is yellow. Issuing findings in a timely manner is a fundamental attribute of the significance determination process (SDP) and it has been a longstanding metric in the ROP in some form. Historically, meeting this metric has been a challenge, especially in the early years of the ROP, but in recent years meeting the metric has also been consistently challenging. Specifically, the staff previously evaluated metric E-3 to be yellow for both CY 2020 and CY 2021. In CY 2022, given the past trend of failing to consistently meet the SDP timeliness goals, the staff performed a review of SDP timeliness focused on the past several years of findings covered by this metric. The results of this review are discussed under the "ROP Program Area Evaluations" section of this paper.

ROP Data Trending Focus Areas

In accordance with IMC 0307 and IMC 0307, Appendix A, the staff reviews the ROP Self-Assessment Data Trending Dashboard regularly. The underlying data in this dashboard are automatically updated daily. The staff reviews data including unresolved items (URIs), licensee event reports, very low safety significance issue resolution (VLSSIR) items, ROP feedback forms, supplemental inspections and hours charged, inspection hours charged by site, baseline inspection hours charged, and baseline inspection samples completed. The staff also maintains a separate operating experience findings dashboard, which is likewise frequently reviewed.

In CY 2022, the staff did not identify any trends of significance from reviewing ROP data. The staff noted that URIs were closed in a timely manner; all URIs opened before May of 2021 have

been closed. Data show that the staff continues to use the VLSSIR process several times a year and addressed 6 issues using the process in CY 2022. As discussed further in the “Inspection Findings Trend” section of this paper, in CY 2022, the number of very low safety or security significance (green) inspection findings increased for the second consecutive year. The staff also provides more information on the overarching efforts related to ROP data trending, visualization, and infrastructure in the “Modernizing ROP Inspection and Assessment through Data Improvements” section of this paper.

ROP Program Area Evaluations

The staff evaluated the four ROP program areas in accordance with IMC 0307: the performance indicator (PI) program, the inspection program, the SDP, and the assessment program. The staff used ROP performance metrics, ROP data trending, internal and external stakeholder feedback, and other relevant information to evaluate the effectiveness of each program area. The discussion of each program area evaluation also summarizes any significant changes during CY 2022, any current or future focus areas, and any recommendations for improvement. The paragraphs below summarize the CY 2022 ROP program area evaluations, with the full program area evaluations provided in the enclosure to this paper.

The PI program continued to provide insights into plant safety and security in CY 2022. For CY 2022, all licensees reported all green PIs. NRC inspectors used Inspection Procedure (IP) 71151, “Performance Indicator Verification,” dated April 6, 2020 (ML20030A017), to periodically review the PI data to independently verify their accuracy and completeness.

The inspection program continued to be effective in independently verifying that commercial nuclear plants were operated safely and securely. The enclosure to this paper provides a detailed evaluation of the inspection program, which includes, recommendations for improvement, current and future focus areas, and significant changes to the inspection program.

The SDP continued to be an effective, risk-informed process for determining the safety and security significance of inspection findings identified in the ROP. Nationwide, for CY 2022 inspections, the NRC issued 376 inspection findings that were determined to be of very low safety or security significance (i.e., green). The NRC also finalized seven GTG findings in CY 2022. As part of the SDP program area evaluation, the staff reviewed SDP timeliness with the objective of identifying any causal factors affecting timeliness and developing recommendations to improve the SDP. Although the staff identified several contributing causes that led to untimely final significance determinations, the staff did not identify any themes or common causal factors. However, the staff did develop five recommendations to broadly improve both the overall SDP and the ROP metric E-3 definition of timeliness. The staff found that clear communication and the use of best-available information to facilitate the decision-making process at each stage of the SDP is vital in meeting the established SDP timeline. The enclosure and the SDP timeliness evaluation report (ML22335A003) include more information on this evaluation.

The staff’s implementation of the assessment program continued to ensure that both the NRC staff and licensees took appropriate actions to address performance issues in CY 2022, commensurate with their safety or security significance. The NRC did not issue any deviations to the ROP Action Matrix during CY 2022.

ROP Implementation Audit

In September 2022, the staff conducted an audit of Region I's implementation of the ROP. The audit team reviewed the four ROP program areas in accordance with IMC 0307, Appendix C, "Reactor Oversight Process (ROP) Self-Assessment ROP Implementation Audit," dated May 29, 2020. This was the second regional ROP implementation audit conducted on a rotating annual basis using the current revision of IMC 0307, Appendix C. The team also evaluated two focus areas by performing a "deep-dive" review of: (1) implementation of IMC 1245, Appendix D1, and (2) problem identification and resolution inspection report write-ups for semiannual trend review inspection samples and annual follow-up of selected issues inspection samples. The audit team also assessed whether any improvements to ROP governance documents were necessary regarding how regional offices implemented ROP-related functions.

The audit concluded that Region I successfully implemented the ROP in accordance with the associated program documents (ML22285A231, non-public). The team identified four strengths and one recommendation for improvement to be considered by Region I and shared with the other regional offices to enhance consistency. The audit team also identified nine program recommendations for consideration by the program office. All program recommendations from this audit have been added to the ROP lessons learned tracking tool, which is discussed further under Element 2 in the section "ROP Lessons Learned Tracker," for tracking these audit recommendations to completion.

Each of the four regions, including Region I, reviewed the audit results and issued a response memorandum (ML22335A490, ML22332A561, ML22348A038, ML22321A305, respectively, all non-public). In CY 2023, the staff plans to conduct an audit of Region II's implementation of the ROP.

Element 2: Assess Effectiveness of Recent ROP Changes and Evaluate the NRC's Response to Significant Licensee Events or Declining Licensee Performance

Element 2 of the ROP self-assessment process evaluates the effectiveness of recent, significant ROP changes (and any additional ROP changes that warrant effectiveness reviews as approved by the Office of Nuclear Reactor Regulation (NRR) management) to ensure that the intended results have been realized and to evaluate any unintended consequences. The sections below describe the results of these reviews for CY 2022.

Effectiveness Review of the Incorporation of Safety Culture Oversight into the ROP

In CY 2022, a multidisciplinary team of staff from multiple agency offices began an effectiveness review of the safety culture assessment program used by NRC staff to provide oversight of licensees. The team charter is available in ADAMS (ML22045A867). The purpose of this effectiveness review was to evaluate how safety culture is currently incorporated into the ROP and determine whether the current safety culture program achieves the objectives as laid out by the Commission in Staff Requirements Memorandum (SRM)-SECY-04-0111, "Staff Requirements—SECY-04-0111—Recommended Staff Actions Regarding Agency Guidance in the Areas of Safety Conscious Work Environment and Safety Culture," dated August 30, 2004 (ML042430661), and in subsequent communications with the staff.

At the bimonthly ROP public meeting on November 17, 2022, the team presented the preliminary results of the review (ML22308A138). The team issued the finalized safety culture effectiveness review report (ML22340A452) on March 20, 2023. Staff from DRO had further

discussions on the results of the effectiveness review at the April 2023 ROP bimonthly public meeting.

Effectiveness Review of Recommendations from IP 95003 Lessons Learned at Arkansas Nuclear One (2017) and Pilgrim Nuclear Power Station (2018)

On June 8, 2017, the staff completed an evaluation of the NRC's assessment and inspection process (ML17160A290) for Arkansas Nuclear One (ANO), as required by IP 95003, "Supplemental Inspection Response to Action Matrix Column 4 (Multiple/Repetitive Degraded Cornerstone) Inputs." This ANO lessons learned evaluation included 10 recommendations for the ROP. On June 6, 2018, the staff completed a similar evaluation (package ML18158A104) for Pilgrim Nuclear Power Station (Pilgrim) upon completion of IP 95003. This Pilgrim lessons learned evaluation documented seven recommendations. As of the recent revision to IMC 0307, effective May 3, 2022, the staff is now required to perform an effectiveness review of the status of all the ROP recommendations resulting from performing IP 95003 within 4 years of the lessons learned report issuance.

The staff performed an effectiveness review (ML22349A505) of the ANO 95003 lessons learned report recommendations. Of the 10 recommendations in the ANO 95003 lessons learned report, the staff has closed five and one is still open and awaiting staff action. The staff has decided not to pursue the remaining four recommendations. The staff concluded that the actions taken to address closure were effective for three of the five closed recommendations. Two recommendations were closed because of actions taken by staff; however, limited additional data were available (e.g., no further IP 95003 inspections were conducted since the recommendations had been closed) to assess if the actions taken to address those recommendations were effective.

In CY 2022, the staff also performed an effectiveness review (ML22321A104) of the Pilgrim 95003 lessons learned report recommendations. Of the seven recommendations in the report, the staff concluded that the actions taken to address closure were effective for three of the recommendations. Two recommendations are still open and awaiting staff action. Two recommendations were closed because of actions taken by staff; however, no additional data were available (e.g., no further IP 95003 inspections were conducted since the recommendations had been closed) to indicate whether the actions taken to address those recommendations were effective.

Evaluate NRC Response to Significant Licensee Events and Declining Licensee Performance

During CY 2022, the NRC did not charter any incident investigation teams in response to operating power reactor events, the NRC did not conduct any supplemental inspections using IP 95003, and no licensees were under NRC oversight in accordance with IMC 0350, "Oversight of Reactor Facilities in a Shutdown Condition due to Significant Performance and/or Operational Concerns," dated March 1, 2018 (ML17116A273). As such, no specific assessments were conducted.

As of December 31, 2022, the staff was tracking eight open recommendations from previously completed assessments. Three of these open recommendations were mentioned in the "Effectiveness Review of Recommendations from IP 95003 Lessons Learned at Arkansas Nuclear One (2017) and Pilgrim Nuclear Power Station (2018)" section above. All these recommendations are also included in the "ROP Lessons Learned Tracker" section below.

ROP Lessons Learned Tracker

As required by IMC 0307, the staff monitored the status of longer-term ROP programmatic changes resulting from more complex ROP feedback, including recommendations from independent evaluations, internal and external audit reports, supplemental and reactive inspection lessons learned reports, and other significant feedback. The staff tracks the status of these longer-term program recommendations in an ROP lessons learned tracker with a focus on timely evaluation and disposition. The staff resolved 25 items from the ROP lessons learned tracker in CY 2022, and as of December 31, 2022, the tracker contains 33 open items, which includes 9 items from the ROP implementation audit of Region I, previously discussed under Element 1. This ROP lessons learned tracker, in conjunction with the ROP feedback form process governed by IMC 0801, "Inspection Program Feedback Process," ensures that recommendations for ROP improvement are gathered, assessed, and tracked to completion.

Element 3: Perform Focused Assessments of Specific ROP Program Areas, Including the Baseline Inspection Program

Focused Assessment

In accordance with IMC 0307, the staff conducts a focused assessment on a triennial basis. As discussed in SECY-22-0029, "Reactor Oversight Process Self-Assessment for Calendar Year 2021," dated April 8, 2022 (package ML22033A288), the baseline inspection program comprehensive review was the focused assessment performed for CY 2021 because the baseline inspection program review and the focused assessment periodicities aligned. The staff plans to conduct the next focused assessment in CY 2024.

Baseline Inspection Program Comprehensive Review and Routine Monitoring

In accordance with IMC 0307, the staff conducts a baseline inspection program comprehensive review every fifth year. The staff performed the most recent baseline inspection program comprehensive review in CY 2021. The staff plans to conduct the next baseline inspection program comprehensive review in CY 2026.

In August 2022, the staff revised IMC 0307, Appendix B, "Reactor Oversight Process Self-Assessment Baseline Inspection Program Monitoring and Comprehensive Review" (ML22117A010), to formally incorporate changes from the memorandum, "Staff Expectations for Inspection Procedure and Inspection Manual Leads of Reactor Oversight Process Governance Documents," dated August 8, 2019 (ML19219A225, non-public). This revision also implemented a revised data-driven process for baseline IP monitoring. On a quarterly basis, each baseline IP lead reviews selected inspection reports and ROP program data for their assigned IPs. The leads report the results of these reviews quarterly to the Baseline IP Monitoring Coordinator through a webform on the ROP Baseline IP Leads SharePoint site.

Following the issuance of the revised IMC 0307, Appendix B, the staff initiated a trial period using the revised IP monitoring and reporting process only with DRO staff. This trial period will allow the staff to evaluate the benefits to the ROP given the staff resources expended and determine whether any further process or guidance changes or improvements are needed. Following a successful trial period in DRO, the staff plans to expand the applicability of revised IMC 0307, Appendix B, to other divisions and offices with ROP baseline IP oversight responsibilities in CY 2024.

Other Related Activities

Status of the ROP and Lessons Learned During the COVID-19 PHE

On November 2, 2021, the director of NRR issued a memorandum (ML21295A302) to the four regional administrators and the director of the Office of Nuclear Security and Incident Response. This memorandum stated the program office's expectation that inspection activities be conducted on site to the extent that is safely possible and to complete the ROP's nominal number of baseline inspection samples for the current and future inspection cycles, while continuing to address site-specific conditions that could impact inspector health and safety. The memorandum also emphasized the availability of inspection flexibilities, as appropriate, such as completing inspections objectives and sample requirements using alternative methods (remotely) or as hybrid inspections (with concurrent or onsite follow-up remote activities, or both).

As stated above, the staff completed the comprehensive baseline inspection program review for CY 2021 (ML21252A154). This review focused on inspection-related lessons learned during the COVID-19 PHE. The review recommended revising inspection program guidance to provide inspectors with the opportunity to credit the review of digital media and documenting inspection best practices related to RI assistance, maximizing digital media quality, interfacing with the licensee, and team inspections.

On July 28, 2022, a staff working group completed a follow-on review of lessons learned, best practices, and challenges that considered the agency experience gained from conducting inspections during the COVID-19 PHE. The charter for this working group, dated November 19, 2021, is available at ML21322A259. The review (ML22172A159) included input and feedback from internal, external, and international sources. The working group concluded that the NRC responded to the challenges of the COVID-19 PHE by exercising existing flexibilities and by improving agency capabilities to meet mission needs using modern communications technology and innovative approaches to inspection. The working group also determined that there was broad agreement internally and externally that onsite and in-person inspection is the most effective and preferred inspection method for most NRC inspection activities.

In conjunction with these overarching conclusions, the working group identified 11 recommendations for program improvements to be applied as broadly as possible so that inspection efficiency and effectiveness can be maintained during normal and abnormal situations. The ROP currently allows for flexible solutions to any inspection-related challenge; however, overly prescriptive requirements or guidance may inadvertently hinder the completion of inspection objectives when challenges arise. Another working group is being chartered to implement selected high- and medium-priority recommendations from the report.

Inspection Findings Trend

The staff has been tracking the trend in green ROP inspection findings over the past several years.¹ The average number of findings per site decreased by approximately 1.5 findings per site each year from 2015 through 2020 but has increased in each of the past 2 years. In 2022,

¹ These green ROP inspection findings include both NRC-identified and self-revealed green findings, but they do not include traditional enforcement violations, licensee-identified violations, minor violations, or observations.

there were 6.8 findings per site (4.0 findings per unit), comparable to what was documented in 2019.

As discussed in a June 10, 2021, Commission meeting (the slides presented by the staff at this meeting are available at ML21154A173), the staff determined through analysis that the general factor underlying the declining trend since 2015 had been a shift to emphasize the consistent application of risk information in the inspection process, and particularly in the inspection finding screening process that is applied once inspectors identify an issue of concern or performance deficiency. Updates to inspection finding screening guidance, along with training and knowledge transfer activities among the regions, led to a more uniform understanding of the threshold for documenting inspection findings across the agency.

Staff Recommendations to the Commission to Revise the ROP

In August 2021, the staff requested, and the Commission approved, the withdrawal of SECY-18-0113, "Recommendations for Modifying the Reactor Oversight Process Engineering Inspections," dated November 13, 2018 (ML18144A567), and SECY-19-0067, "Recommendations for Enhancing the Reactor Oversight Process," dated June 28, 2019 (package ML19070A036). In CY 2022, the staff subsequently provided the Commission with four notation vote papers related to the ROP: SECY-22-0053, "Recommendations for Modifying the Reactor Oversight Process Engineering Inspections Periodicity," dated June 22, 2022 (package ML22080A253); SECY-22-0086, "Recommendations for Revising the Reactor Oversight Process Assessment Program," dated September 16, 2022 (ML22188A221); SECY-22-0087, "Recommendation for Problem Identification and Resolution Team Inspection Frequency," dated September 20, 2022 (ML22145A448); and SECY-22-0089, "Recommendation for Enhancing the Emergency Preparedness Significance Determination Process for the Reactor Oversight Process," dated September 22, 2022 (ML22189A201).

In SRM-SECY-22-0053, dated July 21, 2022 (ML22202A507), the Commission approved the staff's recommendation, and the staff subsequently issued a revision to IP 71111.21M, "Comprehensive Engineering Team Inspection (CETI)," dated October 7, 2022, effective January 1, 2023 (ML19084A030), which incorporates both IP 71111.17T, "Evaluations of Changes, Tests, and Experiments," dated December 8, 2016 (ML16340A998), and the triennial portions of IP 71111.07, "Heat Exchanger/Sink Performance," dated February 18, 2022 (ML22024A114).

In accordance with Commission direction in SRM-SECY-22-0089, dated February 9, 2023 (ML23040A378), in SRM-SECY-22-0087, dated March 3, 2023 (ML23062A686), and in SRM-SECY-22-0086, dated March 10, 2023 (ML23069A093), the staff will make necessary conforming changes to inspection, assessment, and SDP documents under the ROP. The staff will continue to adhere to the requirements in Management Directive 8.13, "Reactor Oversight Process," dated January 16, 2018 (ML17347B670), regarding Commission approval or notification for any additional ROP changes.

Resident Inspector Recruitment and Retention

The Commission issued SRM-SECY-20-0107, "Staff Requirements—SECY-20-0107—Recommendations for Addressing Resident Inspector Recruitment and Retention Challenges," dated February 19, 2021 (ML21050A268, non-public), which approved staff-recommended actions for RI recruitment and retention. The staff has implemented all staff-recommended actions from SRM-SECY-20-0107. In addition, the staff established a working group to address additional taskings in the SRM.

The working group made 12 recommendations (ML22032A158, non-public), which the staff endorsed on May 25, 2022, along with a proposed implementation plan and schedule (package ML22046A187, non-public). These recommendations included using better data to monitor the health of the RI program through a data visualization dashboard ([Resident Inspector Recruitment and Retention Health Dashboard Summary](#), non-public), consolidating responsibilities and documentation for RI program health monitoring and policies, and making several other program adjustments to improve RI opportunities. The staff is carrying out the implementation plan with a completion goal of the end of CY 2023. The staff has also established a RI standing committee (charter ML22206A273, non-public) with both regional and headquarters representation, which is tasked with monitoring RI program health and overseeing implementation of the working group recommendations. This standing committee was established in August 2022 and is intended to be a long-term effort.

Office of Inspector General Event Inquiry at Diablo Canyon

The Office of Inspector General (OIG) published “Event Inquiry into the Nuclear Regulatory Commission’s Oversight of the Auxiliary Feedwater System at Diablo Canyon Nuclear Power Plant” (Case No. 20-025), dated March 25, 2022, and the staff responded publicly to the OIG in a May 3, 2022, memorandum, “Response to the Office of the Inspector General’s Event Inquiry into the Nuclear Regulatory Commission’s Oversight of the Auxiliary Feedwater System at Diablo Canyon Nuclear Power Plant (OIG Case No. 20-025)” (package ML22123A188). The OIG replied to the staff’s response in a May 11, 2022, memorandum, “Reply to the NRC’s Response to the Office of Inspector General’s (OIG) Event Inquiry into the NRC’s Oversight of the Auxiliary Feedwater System at Diablo Canyon Nuclear Power Plant, OIG Case No. 20-025” (package ML22131A159). After reviewing the event inquiry, the staff determined that the ROP and its associated inspection program continue to provide reasonable assurance of adequate protection of public health and safety. The staff concluded that the complete system walkdown of the auxiliary feedwater system at Diablo Canyon Nuclear Power Plant in April 2020 was performed in accordance with IP 71111.04, “Equipment Alignment,” effective January 1, 2019 (ML18047A019) and the COVID-19 mitigation guidance at the time, and with the appropriate resources.

The staff also recognized and appreciated areas where the OIG report provided opportunities to further improve programs, processes, and communications. As a result, the staff provided refresher training on the inspection manual and provided training on corrosion under insulation. The staff also reviewed IP 71111.04 and inspector qualification programs to ensure the requirements and guidance are clear. The staff reviewed ROP program guidance to determine whether additional direction or training should be included to ensure consistent program application across single- and multiple-unit sites. Based on the staff reviews of ROP program documents, the staff concluded that no document revisions were immediately needed; the staff provided some minor recommendations for clarification in IP 71111.04 to the procedure lead for consideration in a future revision. Lastly, the staff invited OIG to present at two regional inspector counterpart meetings and at a DRO division meeting to discuss how OIG is organized and the relationship between OIG and the NRC as an oversight agency. OIG conducted these presentations in the fall of 2022.

Construction Reactor Oversight Process

The cROP is the NRC’s primary means of conducting oversight of licensee construction activities to provide reasonable assurance that facilities have been constructed and will operate safely. It meets this goal by providing reasonable assurance that new plants are constructed in

accordance with their designs and that operational programs are consistent with their description in the final safety analysis report. The cROP assesses licensee performance and objectively measures quality and safety. The Vogtle Project Office (VPO) is the organization in NRR responsible for the cROP. The VPO staff are also responsible for licensing; project management; and oversight of inspections, tests, analyses, and acceptance criteria (ITAAC) for the construction and startup of Vogtle Electric Generating Plant (Vogtle) Units 3 and 4. The Division of Construction Oversight (DCO) in Region II implements the cROP inspection program. Together, these organizations provide effective and efficient oversight of construction activities at Vogtle Units 3 and 4.

In CY 2022, the NRC made a first-of-a-kind finding: on August 3, 2022, the NRC found pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 52.103(g) that the acceptance criteria in the combined license for Vogtle Unit 3 are met and operation of the facility is allowed in accordance with the terms and conditions of the license (package ML20290A280). The NRC staff issued the finding five calendar days following receipt of the “All ITAAC Complete” notification from Southern Nuclear Operating Company, which is less than the 17-day goal in Office Instruction NRR-LIC-114, “Title 10 of the Code of Federal Regulations (10 CFR) Section 52.103(g) Finding and Communication Process,” dated June 15, 2020 (package ML20055E096). Following the affirmative 10 CFR 52.103(g) finding, the NRC transitioned Vogtle Unit 3 to oversight under the ROP.

Throughout CY 2022, the cROP was effective in meeting its goals consistent with the NRC’s Principles of Good Regulation. As discussed in the “Construction Reactor Oversight Process Performance Metric Report for Calendar Year 2022,” dated January 6, 2023 (ML22354A026), the staff found that the cROP successfully met the acceptance criteria for all applicable construction self-assessment program metrics for CY 2022. The NRC did not issue any deviations to the cROP Action Matrix during CY 2022.

The DCO staff effectively implemented the construction inspection program in CY 2022. As of the end of CY 2022, DCO had performed approximately 51,500 hours of direct inspection at Vogtle Units 3 and 4. For transparency, the staff continues to provide updates to the cROP resources expenditure report on the NRC’s public website for both Vogtle Units 3 and 4. With the completion of the cROP for Vogtle Unit 3, the staff no longer inspect ITAAC, as they are no longer applicable. The DCO staff continues to inspect the operational programs and the quality assurance program for Vogtle Unit 3 under the ROP and to implement the full construction inspection program for Vogtle Unit 4. The staff issued an update to the list of ITAAC targeted for inspection by the NRC under the baseline inspection program for Vogtle Unit 4 (package ML22334A075). The update to ITAAC targeting incorporates License Amendment 187 for Vogtle Unit 4, which deletes and consolidates several ITAAC in the combined license. The VPO staff made these ITAAC targeting changes based upon experience from Vogtle Unit 3 ITAAC performance and the input from an expert panel, which convened on December 1, 2022. The ITAAC targeting update does not change the status of any targeted ITAAC and does not impact planned NRC inspection activities.

The staff evaluated domestic and international operational events and construction-related issues for applicability to domestic reactor designs, the new reactor licensing process, and the construction inspection program. The staff effectively implemented the construction SDP, described in IMC 2519, “Construction Significance Determination Process,” dated October 26, 2020 (ML20254A144). The staff did not make any significant changes to the construction assessment and enforcement programs in CY 2022.

The VPO and DCO staffs continue to promote frequent communications with stakeholders through the Vogtle Readiness Group. Formed to better coordinate NRC activities associated with construction oversight at Vogtle, the staff formed the Vogtle Readiness Group based on lessons learned from the Watts Bar Nuclear Plant Unit 2 construction project. In CY 2022, the VPO and DCO staffs held nine public meetings and continued to have a weekly public meeting placeholder available to discuss and resolve licensing and ITAAC issues.

In CY 2022, the staff continued to make progress on the construction lessons learned initiative, which began in CY 2021. During the March 2022 Regulatory Information Conference, the NRC staff held a successful panel session with representatives from Southern Nuclear Operating Company and Westinghouse Electric Company, LLC, to discuss practical experience with the Vogtle combined licenses. The staff also held two public meetings in September 2022 and November 2022 (meeting summaries at ML22271A018 and ML22322A167, respectively) to gather external stakeholder feedback on experience during construction under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," following the 10 CFR 52.103(g) finding for Vogtle Unit 3. The staff continues to leverage its internal knowledge resource wiki, Nuclepedia, to capture the staff's extensive experiences and share results of the construction lessons learned effort internally. The staff plans to publish a publicly available report on its lessons learned initiative in late 2023.

Overall, VPO and DCO continued to successfully implement the cROP to ensure that the licensee meets the requirements of the regulations, the combined license, and the inspection, licensing, and ITAAC programs.

Applying the Modified ROP for AP1000 Units at Vogtle

In SRM-SECY-18-0091, "Staff Requirements—SECY-18-0091—Recommendations for Modifying the Reactor Oversight Process for New Large Light Water Reactors with Passive Safety Systems such as the AP1000 (Generation III+ Reactor Designs)," dated February 24, 2020 (ML20055G004), the Commission directed that in the first three annual self-assessment reports for the ROP after the initial Vogtle AP1000 unit is operating, the staff should include in the self-assessment report a section reporting on any insights, trends, or lessons learned in applying the modified ROP at the Vogtle units. On August 3, 2022, as discussed in the "Construction Reactor Oversight Process" section above, the Commission made its finding under 10 CFR 52.103(g) that the acceptance criteria in the combined license for Vogtle Unit 3 are met and operation of the facility is allowed in accordance with the terms and conditions in the license. The NRC therefore transitioned Vogtle Unit 3 from the cROP to the ROP in accordance with the staff plan described in "Transition to Reactor Oversight Process for Vogtle Electric Generating Plant, Units 3 and 4," dated August 14, 2020 (ML20191A383). Vogtle Unit 3 first reached initial criticality on March 6, 2023. The staff have not identified any insights, trends, or lessons learned during the five months that the modified ROP was applied to Vogtle Unit 3 in CY 2022.

Modernizing ROP Inspection and Assessment Through Data Improvements

In CY 2022, the staff focused its ROP data efforts on enhancing the data capabilities for internal and external stakeholders using dashboards and on improving the overall ROP data infrastructure to both reduce staff effort to maintain the ROP data systems and processes and to improve the overall accuracy and consistency of ROP data. The staff continues to develop new and upgrade existing data visualization dashboards. The staff also continues to implement more automated and rigorous solutions for data entry, data processing, and data validation.

In CY 2022, the staff has made several changes to the ROP public website. Although the overall appearance of the ROP public website has not changed, several upgrades have been made to streamline the process of updating the data displayed. By implementing these upgrades, the staff has made maintenance of the ROP website significantly more efficient and has more closely tied data updates to the same ROP data systems used and maintained by the NRC staff. Through these infrastructure upgrades, the staff has also made it easier to publish future interactive dashboards to the NRC public website and to improve the overall external stakeholder experience.

As discussed in SECY-22-0029, the staff developed an internal end-of-cycle (EOC) dashboard that was used for the CY 2021 EOC assessment review, which took place in the first quarter of CY 2022. The EOC dashboard displays current and past licensee performance and NRC inspection planning data in a central location from several data sources. All four regions used the EOC dashboard to prepare for the CY 2021 EOC assessment review (see section 07.03.b of IMC 0305) which led to a savings of staff time of approximately 30 percent relative to the CY 2020 EOC assessment review. The data in the EOC dashboard are also available internally throughout the year as the information is automatically updated in real time. In preparation for the CY 2022 EOC assessment review, the staff continued to enhance the capabilities of the EOC dashboard based on recommendations from regional users.

In CY 2022, the staff developed two new internal dashboards intended to help staff identify potential ROP data issues or inconsistencies, particularly those related to timeliness, for the staff to monitor, evaluate, and correct. The first dashboard tracks inspection report issuance data, along with data on the inputs into an inspection report (e.g., inspection samples and inspection results) for in-progress inspection reports. This dashboard also summarizes the total number of inspection reports that were issued on time or late in previous years. The second dashboard provides indications of potential ROP data quality or program issues over a wide range of data. For example, this dashboard can identify inconsistencies between Plant Issues Matrix dates and exit dates for inspection findings, identify data inconsistencies between the NRC public website and Reactor Program System (RPS), and flag when ROP inspection samples are not being completed at the expected rate. This dashboard allows the staff to automatically track more than a dozen different indicators, with the ability to display individual data points that make up the indicator, rather than the staff having to manually run individual reports and manually calculate these or similar indicators.

In CY 2022, the staff implemented enhancements to RPS by implementing strategic automatic data entry systems as well as instituting additional validation checks to ensure specific RPS entries properly adhere to program guidance. The validation checks primarily consisted of eliminating nonapplicable options for inspection results, which streamlined the data entry process and improved data analytic output.

Resident Inspector Demographics and Site Staffing

In CY 2022, the staff continued to monitor RI experience, RI turnover, and permanent site staffing in accordance with IMC 0307, Appendix D, "Power Reactor Resident Inspector Retention and Recruitment Program Monitoring and Assessment," dated May 21, 2019 (ML19045A287). The staff reports this analysis on a triennial basis in accordance with COMSECY-15-0014, "Proposed Elimination of Annual Reporting Requirements for Specific Evaluations within the Reactor Oversight Process Self-Assessment Process," dated May 7, 2015 (ML15072A202). The staff previously analyzed CY 2020 data in SECY-21-0038, "Reactor Oversight Process Self-Assessment for Calendar Year 2020," dated April 15, 2021

(package ML210557A137), and plans to provide the next update in the CY 2023 ROP self-assessment paper.

Planned ROP Self-Assessment Activities in CY 2023

The staff has planned several ROP self-assessment activities and other related activities for CY 2023 and intends to discuss these activities in next year's annual ROP self-assessment paper:

- The staff plans to assess the baseline security SDP (BSSDP), IMC 0609, Appendix E, Part I, as part of the ROP program area evaluations under Element 1 of the ROP self-assessment program. The objective of this assessment is to determine whether there are any aspects of the BSSDP that can be improved or further risk-informed. The staff has already begun this assessment by gathering data from internal stakeholders on the BSSDP through a survey.
- The staff plans to perform an ROP implementation audit of Region II under Element 1 of the ROP self-assessment program. The objective of the audit is to appraise regional program performance in terms of an effective and standardized implementation of the ROP.
- The staff plans to complete the effectiveness review of the incorporation of licensee safety culture oversight into the ROP under Element 2 of the ROP self-assessment process. The staff has publicly presented preliminary conclusions and recommendations from this review and is still considering internal and external stakeholder feedback on those recommendations.
- The staff plans to review any insights, trends, or lessons learned in applying the modified ROP for AP1000 units to Vogtle. The staff plans to continue this review in CY 2024 and CY 2025 and include the results each year in the subsequent annual ROP self-assessment paper. The staff also plans to assess the NRC inspector staffing levels during and shortly after the initial startup of Vogtle Unit 3 and 4, as well as the longer term planned steady-state site staffing.

CONCLUSION:

In CY 2022, the staff completed the ROP self-assessment, in accordance with IMC 0307 and its appendices, which consists of ROP performance metrics and data trending, ROP program area evaluations, an ROP implementation audit, effectiveness reviews, the ROP lessons learned tracker, and baseline inspection program routine monitoring. The results of the ROP self-assessment show that the ROP provided effective oversight of operating reactors by meeting the program goals; achieving its intended outcomes of monitoring and assessing licensee performance and taking appropriate regulatory actions; and identifying areas of the ROP for improvement. The results of the CY 2022 cROP self-assessment also show that the cROP was effective in meeting its goals. The NRC implemented the ROP and cROP in CY 2022 in accordance with the NRC Principles of Good Regulation (independence, clarity, openness, reliability, and efficiency), while supporting the agency's mission and strategic goals.

RESOURCES:

This paper does not address any new commitments or resource implications.

COORDINATION:

The Office of the General Counsel reviewed this Commission paper and has no legal objection.

Daniel H. Dorman
Executive Director
for Operations

Enclosure:
CY 2022 ROP Program Area Evaluations

SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR CALENDAR
YEAR 2022 DATED: Month X, 2023

DISTRIBUTION: 201100134

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SECY-012

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DATE	2/22/2023	2/22/2023	2/10/2023	2/13/2023	2/21/2023
OFFICE	NSIR/DPR	NSIR/DSO	OGC	NRR/DRO	NRR
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DATE	2/24/2023	2/24/2023	3/15/2023	3/16/2023	3/29/2023
OFFICE	EDO				
NAME	SMorris for DDorman				
DATE	4/07/2023				

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