



POLICY ISSUE

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FOR: The Commissioners

FROM: Daniel H. Dorman
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SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR
CALENDAR YEAR 2021

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 self-assessment of the Construction ROP (cROP) for calendar year (CY) 2021. As described in SECY-20-0039, "Revisions to the Reactor Oversight Process Self-Assessment Program," dated April 30, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML19218A133), the staff continued to implement the revised ROP self-assessment program for CY 2021. This paper does not address any new commitments or resource implications.

SUMMARY:

The results of the CY 2021 self-assessment show that the ROP is effective in achieving the goals of being objective, risk-informed, understandable, and predictable, as well as supporting the agency's strategic safety and security goals delineated in NUREG-1614, Volume 7, "Strategic Plan: Fiscal Years 2018–2022," issued February 2018 (ADAMS Accession No. ML18032A561), to ensure the safe and secure use of radioactive materials. The staff performed a full ROP self-assessment for CY 2021, which consisted of ROP performance metrics and data trending, ROP program area evaluations, effectiveness reviews, and a baseline inspection program comprehensive review. The ROP self-assessment program

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actively seeks feedback from all stakeholders, internal and external, with the goal of further enhancing and 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 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 supporting the agency's strategic safety and security goals delineated in the NRC's Strategic Plan, NUREG-1614, Volume 7: to ensure the safe and secure use of radioactive materials. The ROP self-assessment program also 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. The staff presents the results for CY 2021 in the "Discussion" section of this paper.

The staff conducted the CY 2021 ROP self-assessment using Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," dated May 29, 2020 (ADAMS Accession No. ML19274B865), and IMC 0307, Appendices A, B, C, and D (ADAMS Accession Nos. ML19274C401, ML19289A965, 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 2021 self-assessment show that the ROP is effective in achieving program goals. The ROP self-assessment program continues to actively seek feedback from all stakeholders, internal and external, with the goal of further enhancing and continuously improving the ROP. The discussion below, categorized by ROP self-assessment program element, details the CY 2021 ROP self-assessment results. A summary of related ongoing ROP activities follows the ROP self-assessment results.

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

Reactor Oversight Process 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 2021, dated March 11, 2022 (ADAMS Package Accession No. ML22068A154), provides data and staff analysis for each ROP metric. The staff found that 13 of 18 ROP metrics were Green for CY 2021. The ROP performance metrics that were evaluated as Yellow or Red are discussed individually below.

As discussed in more detail in the section “Status of the ROP and Lessons Learned during the COVID-19 Public Health Emergency,” the Coronavirus Disease 2019 (COVID-19) public health emergency (PHE) continued to have an impact on ROP implementation in CY 2021, as shown in the results for the CY 2021 ROP performance metrics. Three ROP metrics (I-2, I-3, and I-4), which are described in subsequent paragraphs in this section, were evaluated as Red in CY 2021. These three metrics were also evaluated as Red in CY 2020. Both in CY 2020 and in CY 2021, these three metrics were Red primarily due to the impacts of the COVID-19 PHE. It should be noted that although the staff evaluated ROP metric I-1, “Completion of Baseline Inspection Program,” as Red in CY 2020 due to the impacts of the COVID-19 PHE, in CY 2021, the staff evaluated ROP metric I-1 as Green. On November 2, 2021, in response to the changing conditions of the COVID-19 PHE, the Director of the Office of Nuclear Reactor Regulation (NRR) issued the most recent guidance in a series of inspection guidance memoranda (ADAMS Accession No. ML21295A302) to the four Regional Administrators and the Director of the Office of Nuclear Security and Incident Response (NSIR) that delineates the current inspection guidance and guidance on specific ROP metrics for CY 2021.

Typically, a Yellow or Red metric warrants further evaluation and possible or likely staff action to correct. However, in the case of these three Red metrics, since the cause is clearly the result of staff decisions to protect public health and safety while providing oversight amidst the PHE, the staff does not plan to take immediate action while the COVID-19 PHE is ongoing. These metrics show a relatively short-term impact to the ROP, which is expected to resolve once the ongoing PHE impacts are no longer as significant. As a result, the staff expects that the metrics will return to Green the year following the end of the PHE. The staff is confident that the current agency oversight actions continue to meet the strategic safety and security goals.

The staff has evaluated ROP metric I-2, “Resident Inspector Objectivity through Diverse Experience,” for CY 2021 and found it to be Red. This metric measures whether a resident inspector (RI) spends at least 1 week per year inspecting at a reactor site other than the one to which the RI is assigned, to enhance the RI’s objectivity in accordance with IMC 0102, “Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities,” dated April 24, 2013 (ADAMS Accession No. ML12012A053). For this metric, nearly a third of RIs were unable to inspect at another reactor site during CY 2021 because of travel restrictions due to the COVID-19 PHE.

The staff has evaluated ROP metric I-3, “Inspector Objectivity and Performance Reviews,” for CY 2021 and found it to be Red. This metric measures whether line managers perform annual objectivity reviews of each fully qualified inspector in an inspection branch in accordance with IMC 0102. For this metric in CY 2021, 38 of 300 qualified inspectors did not have an annual objectivity review, primarily because of travel restrictions due to the COVID-19 PHE; 51 qualified

inspectors received a virtual objectivity review while performing virtual interactions with a licensee, which met the intent of the IMC 0102 requirements; and 211 inspectors received an in-person objectivity review.

The staff has evaluated ROP metric I-4, “Fully Qualified Inspectors, Examiners, and Senior Risk Analysts,” for CY 2021 and found it to be Red. This metric measures whether staff members remain fully qualified in accordance with IMC 1245, “Qualification Program for Reactor Inspectors,” dated June 26, 2020 (ADAMS Accession No. ML20077L272), and the corresponding appendices. For this metric in CY 2021, all four regions had a substantial number of staff who were not able to complete post-qualification or refresher training in accordance with IMC 1245, the vast majority due to COVID-19-related training cancellations and travel restrictions. The Division of Reactor Oversight (DRO) has revised IMC 1245, Appendix D1, “Maintaining Qualifications,” dated December 16, 2020 (ADAMS Accession No. ML20246G611), to authorize a one-time blanket deviation for certain IMC 1245 refresher training requirements during the COVID-19 PHE, which allows the individual to continue to perform independent inspection activities. However, ROP metric I-4 specifically counts approved deviations as instances of not meeting the metric for maintaining full qualifications.

The staff has evaluated ROP metric E-3, “SDP Completion Timeliness for Potentially Greater-than-Green Findings,” for CY 2021 and found it to be Yellow. This metric 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 a preliminary determination that a finding is potentially GTG to the licensee, regardless of the final finding significance. In CY 2021, the staff issued three findings subject to this metric, two of which exceeded the timeliness goal. In SECY-21-0038, “Reactor Oversight Process Self-Assessment for Calendar Year 2020,” dated April 1, 2021 (ADAMS Accession Package No. ML21057A137), this metric was also evaluated as Yellow. In response, the staff revised IMC 0609, Attachment 1, “Significance and Enforcement Review Panel (SERP) Process,” effective August 19, 2021 (ADAMS Accession No. ML21148A149), to adjust the SERP escalation process in order to improve timeliness of resolution when there is disagreement among SERP members. The revision also further emphasized the available option of using a modified SERP, if agreed to by all SERP members. The modified SERP allows the voting members to agree (e.g., by e-mail) to advance a preliminary or final significance determination without holding an in-person SERP meeting, if the SERP members agree with the violation and its significance determination of White. This modified SERP could save several weeks in the overall significance determination process (SDP) timeline without detrimental effect. This revision also requires improved documentation and discussion of uncertainties and qualitative considerations as part of the SERP package and discussion, respectively. The staff intends for regional and headquarters staff to use this guidance for processing several potentially GTG findings and then intends to further evaluate the results of this revision. Given the ongoing trend in challenges meeting the SDP timeliness goals, the staff is also planning a review to identify any causal factors affecting SDP timeliness; see section “Planned ROP Self-Assessment Activities in Calendar Year 2022” of this paper for more details.

The staff has evaluated ROP metric C-2, “Maintenance of ROP Governance Documents,” for CY 2021 and found it to be Yellow. This metric measures the percentage of ROP governance documents that have been reviewed within the past 5 years as required by IMC 0040, “Preparing, Revising and Issuing Documents for the NRC Inspection Manual,” dated July 23, 2020 (ADAMS Accession No. ML19352E640). As of the end of CY 2021, of the 232 documents subject to this metric, the staff had issued 188 ROP documents within the past 5 years and had reviewed 29 additional ROP documents and begun the subsequent revision and

reissuance process for those documents. Of the 15 ROP documents subject to this metric that were not reviewed within the past 5 years, 12 are directly related to the engineering and emergency preparedness inspection areas for which the staff had recommended significant changes to the Commission in SECY-18-0113, "Recommendations for Modifying the Reactor Oversight Process Engineering Inspections," dated November 13, 2018 (ADAMS Accession No. ML18144A567), and SECY-19-0067, "Recommendations for Enhancing the Reactor Oversight Process," dated June 28, 2019 (ADAMS Package Accession No. ML19070A036), respectively. The section of this paper titled "SECY-18-0113 and SECY-19-0067" includes more details on the staff's path forward for the recommendations in these withdrawn papers.

Reactor Oversight Process Data Trending Focus Areas

As described in SECY-20-0039, the staff has formally incorporated routine ROP data trending efforts into the ROP self-assessment program. Currently, the staff is updating and reviewing the ROP Self-Assessment Data Trending Dashboard on a periodic basis. The staff is reviewing data including unresolved items, licensee event reports, ROP feedback forms, supplemental inspections and hours charged, and inspection hours charged by site. The staff also maintains a separate operating experience findings dashboard, which is likewise reviewed on a periodic basis.

The staff did not identify any insights or trends of significance from the ROP data trending in CY 2021, with the exception of the slight increase in number of Green inspection findings in CY 2021 compared to CY 2020, which is the first year-over-year increase in Green findings since CY 2011. This trend is discussed in detail in the "Inspection Findings Trend" section of this paper. In CY 2021, the staff continued to make considerable improvements in the quality of the ROP data provided, the level of staff effort needed to update and retrieve ROP data sets, and the data visualizations for future ROP data trending. The staff plans to continue to refine and update the data trending process in support of potential future improvements to the ROP. The staff provides more information on the ongoing staff efforts related to ROP data visualization, trending, and analytics under the section of this paper titled "Modernizing ROP Inspection and Assessment through Data Analytics."

Reactor Oversight Process Program Area Evaluations

The staff completed the CY 2021 ROP program area evaluations in accordance with IMC 0307. The staff evaluated the four ROP program areas: 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 evaluation also summarizes any significant changes to that program area during CY 2021, any current or future focus areas, and any recommendations for improvement. The paragraph below summarizes the CY 2021 ROP program area evaluations, and Enclosure 1 provides the program area evaluations in full.

The PI program continued to provide insights into plant safety and security in CY 2021. In CY 2021, licensees reported 6314 Green PIs and 5 White PIs. All White PIs were for Unplanned Scrams per 7000 Critical Hours. NRC inspectors independently used Inspection Procedure (IP) 71151, "Performance Indicator Verification," dated April 6, 2020 (ADAMS Accession No. ML20030A017), to periodically review the PI data to 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 SDP continued to be an

effective, risk-informed process for determining the safety and security significance of inspection findings identified in the ROP. The NRC issued approximately 289 inspection findings nationwide for CY 2021 inspections that were determined to be of very low safety or security significance (Green). The NRC also finalized one GTG finding in CY 2021. 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 2021, commensurate with their safety significance. The NRC did not issue any deviations to the ROP Action Matrix during CY 2021.

The staff plans to develop a Commission paper in CY 2022 related to the efforts to replace the emergency preparedness alert and notification system PI with an emergency response facility and equipment readiness PI. This revision is discussed in the Performance Indicator Program section of the Program Area enclosure to this SECY.

Reactor Oversight Process Implementation Audit

In CY 2020, the staff conducted an audit of Region IV's implementation of the ROP. In CY 2021, consistent with IMC 0307 direction, the staff did not conduct a regional audit and instead conducted a baseline inspection program comprehensive review under Element 3 of the ROP self-assessment program in accordance with IMC 0307, Appendix B, "Reactor Oversight Process Self-Assessment Baseline Inspection Program Monitoring and Comprehensive Review," and Appendix C, "Reactor Oversight Process (ROP) Self-Assessment ROP Implementation Audit," both effective June 1, 2020. In CY 2022, the staff plans to conduct an audit of Region I'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 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 2021.

Effectiveness Review of the Requirements to Enter Column 3 of the Reactor Oversight Process Action Matrix

In CY 2021, the staff completed a review of the effectiveness of the Degraded Performance (Column 3) column of the ROP Action Matrix. The criteria for entering this column of the ROP Action Matrix were changed in December 2015 from two White inputs in a cornerstone to three White inputs in a cornerstone, consistent with the direction in Staff Requirements Memorandum (SRM)-SECY-15-0108, "Staff Requirements—SECY-15-0108—Recommendation to Revise the Definition of Degraded Cornerstone as Used in the Reactor Oversight Process," dated December 2, 2015 (ADAMS Accession No. ML15335A559).

The effectiveness review concluded that the change to the criteria for the Degraded Performance column in December 2015 has not had an adverse impact on safety, although it may have, in two instances, delayed recognition by the ROP of the full scope of causal factors in a licensee's organization for GTG assessment inputs. The review also concluded the bases for the 2015 change remained largely valid and the information reviewed did not suggest that a threshold of two White inputs is any more or less valid than three White inputs. The review

included several recommendations that have been reviewed and dispositioned by DRO management. The staff documented the results of this effectiveness review in a March 30, 2021, report (ADAMS Accession No. ML21069A154), and the staff documented the disposition of the recommendations from this report in a September 17, 2021, memorandum (ADAMS Accession No. ML21209B001).

Effectiveness Review of the Very Low Safety Significance Issue Resolution Process

The staff implemented the Very Low Safety Significance Issue Resolution (VLSSIR) process on January 1, 2020, so that certain issues of very low safety significance that involve licensing-basis questions can be resolved promptly without an excessive use of resources. As of the end of CY 2021, the staff has dispositioned 11 items via the VLSSIR process. The staff performed an effectiveness review of the VLSSIR process in early CY 2021, which reviewed the seven items dispositioned via the VLSSIR process in CY 2020, and concluded that, overall, the VLSSIR process is working as intended (ADAMS Accession No. ML21070A334). In the effectiveness review, the staff concluded that the VLSSIR process has provided a predictable framework to review, assess, and disposition issues of very low safety significance that are identified in the inspection process that involve ambiguity in the plant licensing basis. The staff also concluded that the VLSSIR process should continue to be maintained as part of the ROP.

The U.S. Nuclear Regulatory Commission's Response to Significant Licensee Events and Declining Licensee Performance

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 23 items from the ROP lessons-learned tracker in CY 2021, and as of December 31, 2021, the tracker is following 37 open items. In CY 2021, the staff incorporated historical items into the lessons-learned tracker from several audits conducted by the Office of the Inspector General since 2012 related to a variety of aspects of the ROP. Four of these items remain open for tracking. Now the staff can more easily assess and track the full scope and breadth of recent complex ROP feedback. This ROP lessons-learned tracker, in conjunction with the ROP feedback form process, governed by IMC 0801, "Inspection Program Feedback Process," dated March 17, 2020 (ADAMS Accession No. ML19343A777), 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

In accordance with the guidance in IMC 0307, the staff conducts a focused assessment on a triennial basis. The baseline inspection program comprehensive review discussed below is counted as the focused assessment for CY 2021, in accordance with IMC 0307 and IMC 0307, Appendix B. The staff plans to conduct the next focused assessment in CY 2024.

Comprehensive Baseline Inspection Program Review

The staff completed the 5-year Comprehensive Baseline Inspection Program Review in November 2021. The purpose of this review was to recommend revisions to inspection program

guidance to standardize implementation of the baseline inspection program in the event of another PHE, or if other circumstances restricted inspector access to licensee facilities. As part of the review, the staff identified several inspection best practices to be captured for knowledge management based on inspection lessons learned from the COVID-19 PHE. The comprehensive baseline inspection program review report is available (ADAMS Accession No. ML21252A154).

The staff recommended revising inspection program guidance in IMC 2515, Appendix E, "Inspection Program Modifications During Pandemics, Epidemics, or Other Widespread Illnesses or Diseases," effective March 27, 2020 (ADAMS Accession No. ML20079E700) to provide inspectors with the opportunity to credit the review of digital media in the form of streaming video, recorded video, and photographs, in lieu of direct observation when conditions preclude inspectors from traveling to or accessing the location. Specific guidance should give inspectors sufficient latitude to either credit or not credit the digital media that a licensee may provide during an inspection in lieu of direct onsite inspection observations based on a determination by the inspector as to the quality and thoroughness of the information provided. The NRC will be better positioned to complete the baseline inspection program in the event of PHEs or other conditions restricting inspector onsite presence if digital media provided by licensees can be credited appropriately. The staff further concluded that documenting best practices as part of knowledge management will improve standardized implementation of the baseline inspection program during a future PHE or similar event. These best practices are documented in Nuclepedia. The staff plans to revise IMC 2515, Appendix E following the completion of the follow-on Covid 19 Lessons Learned and Best Practices working group that is scheduled to be completed in June 2022.

Results of the Continuous Baseline Inspection Procedure Monitoring Program

The NRC revised IMC 0307, Appendix B, on May 29, 2020, to require continuous monitoring of the implementation of the baseline IPs. The revision to IMC 0307, Appendix B, also modified the scope, periodicity, and staff level of effort associated with continuous monitoring. The staff paused continuous monitoring in CY 2021, because the current capabilities of the Reactor Program System (RPS)-Inspections database did not adequately support meeting the IMC provisions for the continuous baseline monitoring program. During this pause, baseline IP leads were still responsible for maintaining their assigned procedures by identifying concerns and addressing those concerns through the procedure revision process, if necessary, and for performing oversight of the implementation of those IPs by reviewing inspection findings, hours, trends, and issues.

The staff plans to revise IMC 0307, Appendix B, in CY 2022 to bring the IMC provisions into alignment with the current capabilities of the RPS-Inspections database. The staff also plans to initiate a trial period for baseline procedure monitoring in DRO on a quarterly and annual basis to evaluate the benefits to the ROP given the amount of staff resources being used for this effort. Following a successful trial period in DRO, the staff plans to expand the applicability of IMC 0307, Appendix B, to other divisions and offices with ROP baseline IP oversight responsibilities.

Other Related Activities**Status of the Reactor Oversight Process and Lessons Learned During the COVID-19 Public Health Emergency**

On January 31, 2020, the U.S. Department of Health and Human Services declared a PHE for the United States to aid the Nation's healthcare community in responding to COVID-19. On March 20, 2020, the NRC required mandatory telework for all non-mission-critical functions. The staff has previously presented a high-level overview of the impact of COVID-19 on the ROP during CY 2020 in SECY-21-0038. Throughout the COVID-19 PHE, the NRC issued a series of successive ROP inspection guidance memoranda that were updated as the PHE conditions and the NRC's PHE posture changed.

On November 7, 2021, the NRC began reentry by transitioning from a maximum telework status to a combination of in-office and telework schedules for its regulatory functions. In concert with the agency's reentry, the Director of NRR issued an inspection guidance memorandum on November 2, 2021 (ADAMS Accession No. ML21295A302), that delineates the latest ROP guidance for CY 2021. This memorandum states that the intent for CY 2021 is to perform resident and regional inspection activities on site while still ensuring the health and safety of inspectors and licensee staff during the continuing PHE, and to complete the nominal baseline inspection samples for the current and future inspection cycles.

The Regions, NRR, and NSIR continued to be successful in accomplishing both onsite and remote oversight activities for operating reactors during the PHE in 2021. The NRC staff continued to implement the baseline and supplemental inspection programs and initial operator licensing examinations, while taking appropriate precautions to minimize exposure to and transmission of COVID-19.

A 17-member staff team identified initial COVID-19 lessons learned and best practices and made recommendations to improve agency readiness for future emergency and nonemergency conditions. The team documented its conclusions in the "Initial Report on Challenges, Lessons Learned and Best Practices from the 2020 COVID-19 Public Health Emergency," issued January 2021 (ADAMS Accession No. ML20308A389). The CY 2021 comprehensive baseline inspection program review performed under Element 3 of the ROP self-assessment program, described above, continued to build on the conclusions of the initial COVID-19 lessons-learned report.

As intended, following the completion of the initial internal COVID-19 lessons learned review, the staff is conducting a follow-on review of lessons learned, best practices, and challenges that will consider the additional experience gained from conducting inspections during the PHE. This review will include engagement with external stakeholders and explore the impacts of the increased flexibilities used during the COVID-19 PHE on the effectiveness and efficiency of the inspection program overall in order to identify potential enhancements to the program for both emergency and nonemergency use. The charter for this review is available (ADAMS Accession No. ML21322A259).

Inspection Findings Trend

The staff has been tracking a declining trend in Green ROP inspection findings over the past few years.¹ The average number of findings per site decreased by approximately 1.5 findings per site each year from 2015 through 2020. In 2021 the ROP inspection program finished with approximately 5.2 findings per site (3.1 findings per unit), slightly higher than the 4.4 Green findings per site (2.6 findings per unit) issued in 2020 (though still lower than 2019 or any previous year under the ROP) and is the first year-over-year increase in Green inspection findings since 2011. In GAO-13-743, “Nuclear Power: Analysis of Regional Differences and Improved Access to Information Could Strengthen NRC Oversight,” dated September 2013 (ADAMS Accession No. ML14059A299), the Government Accountability Office reported that a comprehensive analysis of regional differences identifying non-escalated inspection findings could determine if regional offices were applying regulations and guidance consistently. The most recent data indicates that the staff corrective actions have resulted in greater consistency across the regions in identifying and documenting Green findings.

As discussed in the Commission meeting on June 10, 2021, as described in SRM M210610, “Staff Requirements—Briefing on Results of the Agency Action Review Meeting,” dated June 15, 2021 (ADAMS Accession No. ML21166A061), the staff analyzed the declining findings trend of the past several years for various possible data correlations. The general factor underlying the declining trend has been a shift over this time to emphasize risk in the inspection process, particularly in the inspection finding screening process applied once inspectors have identified an issue of concern.

The staff also continues to monitor and evaluate trends in inspection findings to identify any potential impact from the COVID-19 PHE or ROP inspection guidance implemented during the PHE; however, any trends from the PHE may not be evident until a few years of findings data are available after the PHE ends.

Inspectors continue to monitor licensee performance, communicate their observations to licensees, and identify performance deficiencies that are entered into licensee corrective action programs for further evaluation, regardless of whether they screen through the process as inspection findings. As discussed above in this paper, analysis of the ROP performance metrics and the overall results of the CY 2021 ROP self-assessment continue to show that the ROP is effective in achieving the goals of being objective, risk-informed, understandable, and predictable and supporting the agency’s strategic safety and security goals.

In addition to findings, PIs are another important assessment tool of the ROP that complements inspections and any resultant findings and would also indicate whether there were significant adverse licensee performance trends in the areas that are well covered by PIs. The staff has not observed any recent increasing or decreasing trends in PIs. A review of indicators independent of the ROP, including scram trends, safety system functional failures, other equipment failure data, collective radiation exposure data and analysis from the Accident Sequence Precursor (ASP) Program (see “U.S. Nuclear Regulatory Commission Accident Sequence Precursor Program 2020 Annual Report,” issued March 2021 (ADAMS Accession No. ML21076A241)), provides independent confirmation that the ROP is effectively maintaining reasonable assurance of adequate protection.

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.

Problem Identification and Resolution Inspection Procedure Revision

In the CY 2020 ROP Self-Assessment Commission paper, SECY-21-0038, the staff informed the Commission that there were several enhancements that could improve the overall effectiveness of the problem identification and resolution inspection program. The team's report, charter, and other supporting documents are available (ADAMS Accession No. ML20247J590). In December 2021, the staff updated IP 71152, "Problem Identification and Resolution," (ADAMS Accession No. ML14316A042) to move the daily review commitments to IMC 2515, Appendix D, "Plant Status," (ADAMS Accession No. ML21281A180). This update also brought the procedure format up to date with current expectations, added additional codes for tracking purposes, and clarified safety conscious work environment guidance. In CY 2022, the staff will engage with the Commission on the periodicity of the problem identification and resolution team inspection, currently biennial; and following this, the staff plans to update IP 71152 again to incorporate both the commission's periodicity direction and also the recommendations of the comprehensive review report.

SECY-18-0113 and SECY-19-0067

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," and SECY-19-0067, "Recommendations for Enhancing the Reactor Oversight Process." The staff is aligned on a plan to return the recommendations in these withdrawn papers back to the Commission prior to the end of September 2022 and discussed the plan with stakeholders at a public meeting on January 26, 2022 (see public meeting presentation "Staff Plan on Recommendations from SECY-18-0113 and SECY-19-0067," ADAMS Accession No. ML22025A132). The staff plans to provide the Commission with Notation Vote papers associated with recommended changes from the staff in the areas of frequency of engineering inspections, revision to the emergency preparedness SDP, and the elimination of the requirement for inspection findings to remain ROP Action Matrix inputs for four full quarters coincident with a change to the treatment of GTG PIs. Additionally, the staff is planning to issue a COMSECY with options and a recommendation on the frequency of problem identification and resolution inspections. The staff will adhere to the requirements in Management Directive 8.13, "Reactor Oversight Process," dated January 16, 2018 (ADAMS Accession No. 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," (ADAMS Accession No. ML21050A268, nonpublic) on February 19, 2021, which approved the staff-recommended actions for RI recruitment and retention. The staff implemented those actions and updated the Commission on their status through a Note to Commissioners' Assistants (ADAMS Accession No. ML21321A318, nonpublic). An additional status update was provided through a Note to Commissioner's Assistants in March 2022 (ADAMS Accession No. ML22046A236). The SRM also tasked the staff with additional actions to address RI staffing concerns. In response, the staff formed a working group to implement these additional actions. The charter for this working group is available (ADAMS Accession No. ML21279A199, (nonpublic)).

The working group, which had members from each region, made several recommendations to

DRO management in a memorandum on February 25, 2022, (ADAMS Package Accession No. ML22032A158, nonpublic). These recommendations include, among other things, using better data analytics to continuously monitor the health of the RI program through a new data visualization dashboard, consolidating roles and responsibilities for RI program health monitoring and policies into a single position within DRO, and making several other program adjustments to improve inspector telework opportunities and the ability of RIs to move across the agency and seek promotional opportunities. Implementation of some of these recommendations will also require an update to IMC 0307, Appendix D, "Power Reactor Resident Inspector Retention and Recruitment Program Monitoring and Assessment: Pilot," dated May 21, 2019, projected for implementation January 2023.

Construction Reactor Oversight Process

The cROP ensures that new commercial nuclear power plants 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 program office in NRR responsible for the cROP. VPO is 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 make the safe use of nuclear power possible through effective and efficient oversight of construction activities at Vogtle Units 3 and 4.

Throughout CY 2021, the cROP was effective in meeting its goals of being objective, predictable, understandable, and open, and remained consistent with the NRC's Principles of Good Regulation. As discussed in the "Construction Reactor Oversight Process Performance Metric Report for Calendar Year 2021," dated January 4, 2022 (ADAMS Accession No. ML21342A021), the staff successfully met the acceptance criteria for all but one construction self-assessment program metric for CY 2021. The staff did not meet a metric involving the reopening of previously accepted ITAAC closure notifications (ICNs). Specifically, the NRC reopened two ICNs, one each for Vogtle Units 3 and 4, because the staff identified that in order to test certain incore instruments in their as-built location, as required by the ITAAC, fuel would need to be loaded into the core to support those instruments. Given that fuel loading cannot occur until after all ITAAC have been met and the NRC makes a Title 10 of the *Code of Federal Regulations* Section (10 CFR) 52.103(g) determination, this ITAAC could not have been completed in the as-built configuration. To resolve this discrepancy, the licensee submitted a license amendment request to remove the as-built provision from the ITAAC. This change did not materially affect the required verification of the ITAAC, and the NRC approved this request in License Amendments 188 and 186 (ADAMS Package Accession No. ML21237A205) for Vogtle Units 3 and 4, respectively. The licensee subsequently resubmitted the ICNs for these ITAAC on October 20 and 27, 2021 (ADAMS Accession Nos. ML21293A231 and ML21300A358, respectively). The NRC has found the ICNs to be acceptable. The NRC conducted an extent of condition review of all remaining ITAAC for Units 3 and 4 and did not identify any other issues where an ITAAC could not be completed as required. The NRC did not issue any deviations from the cROP Action Matrix during CY 2021.

The staff effectively implemented the construction SDP (IMC 2519, "Construction Significance Determination Process," dated October 26, 2020 (ADAMS Accession No. ML20254A144)), in support of the cROP's goals. For example, during the assessment period, the construction SDP

was used to effectively and efficiently disposition the first two GTG inspection findings under the cROP, which were associated with cable installation issues at Vogtle Unit 3. The staff did not make any significant changes to the construction assessment and enforcement programs in CY 2021. The staff also evaluated domestic and international operational events and construction-related issues. The staff did not identify issues that warranted substantive changes to the new reactor licensing process or the construction inspection program.

As the program office for the cROP, VPO maintains a dedicated team of ICN reviewers, as well as an expanded ad hoc surge team of staff, for the expected increase in ICNs at the end of Unit 3 construction. Despite the dynamic nature of construction and periodic schedule changes, VPO has the resources needed to handle the ICN surge. The VPO's staff is also prepared for any licensing demands needed to support the staff's ability to make a timely 10 CFR 52.103(g) finding for Vogtle Unit 3 if all acceptance criteria in the ITAAC are met.

The DCO effectively implemented the construction inspection program in CY 2021. To date, DCO has performed approximately 48,000 hours of direct inspections at Vogtle Units 3 and 4. DCO continues to adapt to the COVID-19 PHE and the licensee's dynamic construction schedule and has adjusted the inspection program to ensure its effectiveness while protecting the health and safety of inspectors and licensee staff. The inspection staff has performed onsite inspections in response to a construction schedule that continues 7 days per week, as the licensee increases efforts to reach the end of construction. DCO's inspection staff has proven to be resilient and flexible in implementing the construction inspection program despite challenges created by the COVID-19 PHE.

Open and frequent communications with the licensee and other external stakeholders is a high priority for VPO and DCO. The VPO notices weekly public meetings to effectively promote public engagement in licensing activities and emerging ITAAC issues. The Vogtle Readiness Group, which the staff formed to coordinate and oversee construction completion at Vogtle, held public meetings in April and December 2021 to communicate the expected activities and milestones as the project approaches the 10 CFR 52.103(g) finding for Vogtle Unit 3. This successful public outreach provides regular information sharing with interested external stakeholders.

Finally, to further the agency's knowledge management and identify areas for improvement, the staff began a lessons-learned initiative in CY 2021. The staff is assessing the licensing and inspection programs used for the Vogtle and Virgil C. Summer Nuclear Station projects to improve the effectiveness and efficiency of future construction oversight programs. The charter for this lessons-learned initiative is available (ADAMS Accession No. ML21160A031). The staff is planning a public meeting in mid-2022 to collect external stakeholder input. The staff is also leveraging Nuclepedia, an internal knowledge resource wiki, as part of this initiative and expects to publish a publicly available report within 5 months of the beginning of commercial operation for Vogtle Unit 3.

Overall, VPO and DCO continue to successfully implement the cROP to ensure that the licensee meets the requirements of the regulations and the combined license.

Modernizing the Reactor Oversight Process Inspection and Assessment through Data Analytics

In CY 2021, the staff focused ROP data efforts on providing centralized and more readily and visually accessible data both internally to NRC staff and externally to interested stakeholders, where feasible. The staff achieved this by developing new, or upgrading existing, data

visualization dashboards; by adding features to existing dashboards to allow users to explore and trend relevant data; and by making data sources more easily accessible and automatically updated. The staff completed development of an internal end-of-cycle (EOC) dashboard that displays current and past licensee performance and NRC inspection planning data in a central location from several data sources. The EOC dashboard is intended to make regional EOC review meeting preparation more efficient and to provide a common data display for use during the meeting (see Section 07.03 “End-of-Cycle Reviews” of IMC 0305, “Operating Reactor Assessment Program,” dated June 28, 2021 (ADAMS Accession No. ML21092A111)). The information in the dashboard is also available throughout the year as the information is automatically updated in real time.

As previously discussed under the “Resident Inspector Recruitment and Retention” section of this paper, the staff is in the process of developing an internal dashboard focused on RI program health. This RI dashboard and the data displayed should enable more accurate and real-time analysis of RI program health trends across the entire RI program and facilitate the staff’s ability to identify any potential RI staffing issues in advance and initiate timely actions to address the issues. In an effort to centralize access to available ROP-related data and information, in CY 2021, the staff deployed an internal ROP operating experience and dashboard hub. The hub provides links to dashboards for trending a variety of ROP data and other reactor information, as well as dashboards with search features for a variety of documents that include operating experience gained since the inception of the ROP, including generic communications, licensee event reports, and internal staff communications.

To continue to facilitate transparency and public access to data, in CY 2021, the staff published two ROP dashboards to the public Web site. The ASP Program dashboard displays 50 years of ASP Program data and allows the public to filter data by plant, region, risk, and affected system. The operating reactor scrams dashboard displays scram-related data over the past 10 years, providing ready access to the public to detailed information about these events of interest. The scrams dashboard has information about scram trends over time that previously would have taken extensive time to compile from individual publicly available sources.

In CY 2021, the staff leveraged the existing indexing for inspection samples in RPS-Inspections and created a software tool to effectively display completed samples for IPs performed since 2019. The inspection sample tool streamlined the process for an inspector to determine the sample history of a specific IP to ensure that the inspectors can select diverse and risk-significant samples. Similarly, the inspection sample tool can assist IP leads in determining any effect that sample selection has on inspection results, allowing targeted modifications to the inspection program as needed. Also, in CY 2021, the staff centralized the tracking in RPS-Inspections of all licensee-planned corrective actions stemming from supplemental inspections. This staff effort resulted in an effective way for inspectors to follow up on the status of risk-significant corrective actions that the licensee had not yet completed at the conclusion of a supplemental inspection.

Resident Inspector Demographics and Site Staffing

In CY 2021, the staff continued to monitor RI experience, RI turnover, and permanent site staffing in accordance with IMC 0307, Appendix D. 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 (ADAMS Accession No. ML15072A202). The staff previously analyzed CY 2020 data in SECY-21-0038 and plans to provide the next update in the CY 2023 ROP self-assessment paper.

Planned ROP Self-Assessment Activities in Calendar Year 2022

The staff has planned several ROP self-assessment activities and other related activities for CY 2022 and plans to discuss these activities in next year’s annual ROP self-assessment paper:

- The staff plans to review SDP timeliness under the ROP program area evaluations under Element 1 of the ROP self-assessment program, focused on the past several years of findings covered by ROP metric E-3. The objective of this review is to identify any causal factors affecting SDP timeliness given that the staff evaluated this metric as Yellow in CY 2020 and CY 2021. Depending on the outcome of the review, the staff may recommend program improvements to ensure timely decision making and communication.
- The staff plans to perform an ROP implementation audit of Region I under Element 1 of the ROP self-assessment process. 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 perform an effectiveness review of the incorporation of safety culture oversight into the ROP under Element 2 of the ROP self-assessment process. The staff plans to focus on the inspection and assessment program areas of the ROP to determine whether safety culture oversight is being implemented effectively.
- The staff plans to review the Office of Inspector General (OIG)’s report, “Event Inquiry into the Nuclear Regulatory Commission’s Oversight of the Auxiliary Feedwater System at Diablo Canyon Nuclear Power Plant,” dated March 25, 2022, and plans to respond publicly to the OIG report.
- As directed 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 (ADAMS Accession No. ML20055G004), after the initial operation of the first AP1000 unit at Vogtle, the staff plans to review any insights, trends, or lessons learned in applying this modified ROP for AP1000 units and to report on this review in the annual ROP self-assessment paper. The staff also plans to assess the NRC inspector staffing levels during and shortly after initial startup, as well as the longer term planned steady-state site staffing.

CONCLUSION:

The results of the CY 2021 self-assessment show that the ROP provided effective oversight of operating reactors by meeting the program goals of being objective, risk-informed, understandable, and predictable; achieving its intended outcomes of monitoring and assessing licensee performance and taking appropriate regulatory actions; and identifying areas of the ROP for improvement. The NRC implemented the ROP in CY 2021 in accordance with the NRC Principles of Good Regulation (independence, clarity, openness, reliability, and efficiency),

while supporting the agency's mission and strategic safety and security goals. The staff completed the CY 2021 ROP self-assessment in accordance with IMC 0307 and its appendices, as well as with Appendix C to NUREG-1614, Volume 7.

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.



Signed by Dorman, Dan
on 04/08/22

Daniel H. Dorman
Executive Director
for Operations

Enclosure:
CY 2021 ROP Program Area
Evaluations

SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR CALENDAR
YEAR 2021 DATED: April 8, 2022

Ticket No.: 201100134

ADAMS Accession Nos: Package No.: ML22033A288 SECY No.: ML22033A287
Enclosure 1 No.: ML22033A293

SECY-012

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DATE	2/16/2022	3/3/2022	3/4/2022	3/15/2022	04/08/22

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