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POLICY ISSUE (Information)

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SECY-21-0038

FOR: The Commissioners

FROM: Margaret M. Doane
Executive Director for Operations

SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR
CALENDAR YEAR 2020

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) 2020. 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 implemented the revised ROP self-assessment program for CY 2020. This paper does not address any new commitments or resource implications.

SUMMARY:

The results of the CY 2020 self-assessment show that the ROP is effective in reaching the goals of being objective, risk-informed, understandable, and predictable, as well as in supporting the agency's strategic safety and security goals delineated in NUREG-1614, Volume 7, "Strategic Plan: Fiscal Years 2018–2022," dated February 28, 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 2020, which consisted of ROP performance metrics and data trending, ROP program area evaluations, effectiveness reviews, and continuous baseline inspection program monitoring. 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, as well as CY 2020 resident inspector (RI) demographics for operating reactors.

BACKGROUND:

The ROP is the NRC's program to inspect, measure, and assess the safety and security performance of operating commercial nuclear power plants and to respond to any decline in their 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 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, 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 2020 in the "Discussion" section of this paper.

The staff conducted the CY 2020 ROP self-assessment using the recently revised 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 2020 self-assessment show that the ROP is effective in achieving the program goals of being objective, risk-informed, understandable, and predictable, as well as ensuring the agency meets its strategic safety and security 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 2020 ROP self-assessment results. A summary of related ongoing ROP activities and CY 2020 RI demographics follows the ROP self-assessment results.

Element 1: Measure Regional and Program Office Effectiveness and Uniformity in Implementing the ROPReactor 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, warrants further evaluation, and likely staff action to address the cause.

The ROP Performance Metric Report for CY 2020, dated March 9, 2021 (ADAMS Accession No. ML21048A262), provides data and staff analysis for each ROP metric. The staff found that 13 of 18 ROP metrics were green for CY 2020. The ROP performance metrics that were 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 PHE,” the Coronavirus 2019 (COVID-19) public health emergency (PHE) had an impact on ROP implementation, as shown in the results of the CY 2020 metrics. Four ROP metrics (I-1, I-2, I-3, and I-4) were red, primarily due to the impacts of the COVID-19 PHE. In response to the COVID-19 PHE, the NRC issued ROP inspection guidance for CY 2020, including guidance on specific ROP metrics, in the May 28, 2020, memorandum (ADAMS Accession No. ML20141L766) from the Director of the Office of Nuclear Reactor Regulation (NRR) to the four Regional Administrators and the Director of the Office of Nuclear Security and Incident Response (NSIR). Updated ROP inspection guidance for CY 2021 was subsequently issued in a February 1, 2021, memorandum (ADAMS Accession No. ML21027A274).

Typically, a yellow or red metric warrants further evaluation and possible or likely staff action to correct. However, in the case of these four red metrics, since the cause is very 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 actions meet the agency’s strategic safety and security goals.

The staff has evaluated ROP metric I-1, “Completion of Baseline Inspection Program,” for CY 2020 and found it to be red. Most inspection procedures (IPs) were either completed in CY 2020 or, if allowed by the 3-year ROP inspection cycle, rescheduled for CY 2021 or CY 2022. However, some IPs, specifically IP 71111.11 “Licensed Operator Requalification Program and Licensed Operator Performance” (biennial), IP 71111.20, “Refueling and Other Outage Activities” (annual), IP 71124.01, “Radiological Hazard Assessment and Exposure Controls” (annual), IP 71130.02, “Access Control” (annual), and IP 71130.03, “Contingency Response—Force-on-Force Testing” (triennial), could not be completed at all reactor sites during CY 2020. While most elements of these IPs were still completed, some inspectors at

some sites were not able to complete the required on-site walkdowns, verifications, or observations; thus, the IPs were incomplete overall. The baseline inspection program, although not fully completed, was still implemented by the regions and NSIR in CY 2020. The NRC completed nearly 150,000 baseline inspection hours in CY 2020 for all operating nuclear plants in the United States, with a two-unit site averaging about 2,700 hours.

Force-on-force exercises require extensive planning, a large number of interdisciplinary participants, and a broad range of activities that require gatherings of both small and large groups. The unique scope of the inspection created scheduling challenges and could not reasonably be completed later in the ROP cycle. As a result, the staff implemented a new inspection procedure, IP 92707,¹ to inspect key elements of a site's protective strategy for those sites where IP 71130.03 could not be conducted.

The staff has evaluated ROP metric I-2, "Resident Inspector Objectivity through Diverse Experience," for CY 2020 and found it to be red. This metric measures whether a RI spends at least one week per year inspecting at a reactor site other than the one to which they are assigned, to enhance their 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 2020 because of travel restrictions due to the COVID-19 PHE. A few RIs were still able to perform these objectivity inspections by remotely participating in team inspections, but that did not significantly impact the results of this metric.

The staff has evaluated ROP metric I-3, "Inspector Objectivity and Performance Reviews," for CY 2020 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 2020, approximately a quarter of qualified inspectors did not have an annual objectivity review, primarily because of travel restrictions due to the COVID-19 PHE. Approximately one quarter of qualified inspectors received a virtual objectivity review while performing virtual interactions with a licensee, which met the intent of IMC 0102 requirements, while the remaining 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 2020 and found it to be red. This metric measures whether the staff remains 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 2020, all four regions had staff members who did not maintain their qualifications in accordance with IMC 1245, the vast majority due to COVID-19 PHE related course cancellations and travel restrictions. The Division of Reactor Oversight 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. However, the 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 2020 and found it to be yellow. This metric measures

¹ IP 92707, "Security Inspection of Facilities Impacted by a Local, State or Federal Emergency where the NRC's Ability to Conduct Triennial Force-on-Force Exercises is Limited" (ADAMS Accession No. ML20182A668, nonpublic).

whether potentially greater-than-green (GTG) findings have a final significance determination issued within 255 days of identification. In CY 2020, of the four potentially GTG findings issued, three were issued outside of the metric timeliness goal. For two of these findings, the primary contribution to missing the timeliness goal was other office review processes outside of the bounds of the ROP. The staff does not see a trend related to the third finding and is not planning any specific program changes as a result. This single ROP metric was created as part of the effort described in SECY-20-0039 by combining the timeframe for two previous ROP metrics (120 days and 90 days), in addition to the timeframe for issuing an inspection report (45 days). In the CY 2019 ROP self-assessment, documented in SECY-20-0040, "Reactor Oversight Process Self-Assessment for Calendar Year 2019, dated May 1, 2020 (ADAMS Accession No. ML20037B156), one of these precursor ROP metrics was evaluated as red and the other was evaluated as green. The staff will consider whether to revise this metric further to account for circumstances outside of the bounds of the ROP. The staff will continue to monitor the results of this revised metric in CY 2021 and will continue to engage with these potentially GTG issues in process to determine whether improvements can be made to ensure timely staff decision-making and communication.

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. Data the staff is reviewing includes 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 OpE Findings Dashboard, which is likewise reviewed on a periodic basis. The results of this ongoing review are discussed under "Inspection Findings Trend."

The staff did not identify any insights or trends of significance from the ROP data trending in CY 2020, with the exception of the declining trend in green inspection findings. However, a potentially significant factor in the ROP data trending for CY 2020 is the impact of the ongoing COVID-19 PHE, further discussed under "Status of the ROP and Lessons Learned during the COVID-19 PHE." The staff plans to continue to improve the quality of the data provided and the data visualizations for future ROP data trending. The staff provides more information on the ongoing staff efforts related to ROP data trending under "Modernizing ROP Inspection and Assessment through Data Analytics."

Reactor Oversight Process Program Area Evaluations

The staff completed CY 2020 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 significance determination process (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. Each evaluation also summarizes any significant changes to that program area during CY 2020, any current or future focus areas, and any recommendations for improvement. The discussion below summarizes the CY 2020 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 2020. NRC inspectors independently used IP 71151, "Performance Indicator Verification," 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. As discussed in detail in the section “ROP Performance Metrics,” in CY 2020, the agency was unable to complete the baseline inspection program. The baseline inspection program, although not fully completed, was still implemented by the regions and NSIR in CY 2020. The NRC completed nearly 150,000 baseline inspection hours in CY 2020 for all operating nuclear plants in the United States, with a two-unit site averaging about 2,700 hours. The section “Status of the ROP and Lessons Learned during the COVID-19 PHE” provides additional information related to the agency implementation of the baseline inspection program during the ongoing COVID-19 PHE. 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 248 inspection findings nationwide for CY 2020 inspections that were determined to be of very low safety or security significance (green). The NRC also finalized four GTG findings in CY 2020. 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 2020, commensurate with their safety significance. The NRC did not issue any deviations to the ROP Action Matrix during CY 2020.

Reactor Oversight Process Implementation Audit

In September 2020, the staff conducted an audit of Region IV’s ROP implementation. This was the first ROP implementation audit conducted after completion of the staff’s 2019 holistic review of the ROP self-assessment program and the associated revision to IMC 0307, which was effective in June 2020. The staff previously completed peer reviews for Region II in 2016 and Region III in 2018. 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: (1) assessment, (2) SDP, (3) inspection, and (4) PI. The team also used a deep-dive review to evaluate two focus areas: (1) implementation of IMC 2515, Appendix C, “Special and Infrequently Performed Inspections,” (ADAMS Accession No. ML20321A277) and (2) clarity, accuracy, and use of regional data entry into Reactor Program System (RPS)—Inspections. The team members also assessed whether there were any necessary improvements to ROP governance documents for how regional offices implemented ROP-related functions.

The audit concluded that Region IV implemented the ROP effectively and uniformly in accordance with NRR program office guidance (ADAMS Accession No. ML20290A887, nonpublic). The audit identified five strengths and six recommendations for improvement to be considered by Region IV and shared with the other regional offices to enhance consistency. Each region, including Region IV, reviewed these recommendations, and issued response memoranda (ADAMS Accession Nos. ML21006A016, ML21011A152, ML21008A366, ML21008A081, all nonpublic). The audit also identified 14 program recommendations for consideration by the program office. All 20 regional and program recommendations from this audit have been added to the ROP lessons-learned tracker, which is discussed further in “NRC Response to Significant Licensee Events and Declining Licensee Performance,” for tracking these audit recommendations to completion.

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 2020.

Effectiveness Review of the Cross-Cutting Issues Program

In CY 2019, the staff began a review of the effectiveness of changes made in CY 2015 to the cross-cutting issues (CCI) program, which is governed by IMC 0305, "Operating Reactor Assessment Program," dated November 4, 2020 (ADAMS Accession No. ML20273A317), and IMC 0310, "Aspects within the Cross-Cutting Areas," dated February 25, 2019 (ADAMS Accession No. ML19011A360). The specific changes under review included increasing the cross-cutting theme threshold from four to six findings with a common cross-cutting aspect, introducing cross-cutting theme backstop thresholds, and adding a requirement that a theme repeat three times before a CCI is opened. The staff wrote the CY 2019 ROP self-assessment paper (ADAMS Package Accession No. ML20037B154) after it had substantially completed its review and was considering internal and external stakeholder feedback on preliminary conclusions and recommendations.

In CY 2020, the staff completed the review of stakeholder comments and documented the CCI effectiveness review effort. The staff issued the final CCI effectiveness review report on September 21, 2020 (ADAMS Package Accession No. ML20239A806). The staff found that the CCI program continues to have value by providing a focus on patterns of safety culture behaviors, but the changes implemented in 2015 resulted in a program that appears to be less responsive to cross-cutting behavior indicators and thus introduced concerns about whether the program would proactively identify cross-cutting concerns consistent with the program objective. The NRR Office Director is currently consulting with the Regional Administrators while considering the recommendations in the report in combination with recommendations discussed in "Review of the Problem Identification and Resolution Inspection" section below, given the two programs are complementary.

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

In CY 2020, the staff began a review of the effectiveness of a change to the definition of degraded cornerstone implemented in CY 2016. Specifically, in response to an ROP independent assessment conducted in 2013, a working group evaluated the Column 3 threshold and recommended, in SECY-15-0108, "Recommendation to Revise the Definition of Degraded Cornerstone as Used in the Reactor Oversight Process," dated August 28, 2015 (ADAMS Accession No. ML15076A066), revising the threshold of two white inputs in a cornerstone to three. The other aspects of the Column 3 threshold (three white inputs in a strategic performance area or one yellow input) remained unchanged. The Commission approved the recommendation in Staff Requirements Memorandum (SRM)-SECY-15-0108, dated December 2, 2015 (ADAMS Accession No. ML15335A559). The staff made a corresponding change to IP 95001, "Supplemental Inspection Response to Action Matrix Column 2 (Regulatory Response) Inputs," since this supplemental IP would now also be used to evaluate two white inputs in a single cornerstone.

The staff is reviewing the basis for the Column 3 change implemented in CY 2016, whether the change has been implemented as intended and has achieved intended outcomes, and whether any unintended consequences have resulted from the change. As part of this effectiveness

review, the staff is also considering the level of effort expended by the NRC staff to address and respond to the information provided by licensees in response to potentially white findings.

Implementation of the Very Low Safety Significance Issue Resolution Process

The NRC implemented the Very Low Safety Significance Issue Resolution (VLSSIR) process on January 1, 2020, to improve existing NRC processes so that certain very low safety significance issues that involve licensing-basis questions are promptly resolved without an excessive use of resources, thereby enabling the NRC and licensees to better focus resources on issues of greater safety significance. The staff implemented the VLSSIR process improvements in revisions to IMC 0612, Appendix B, "Additional Issue Screening Guidance," dated December 12, 2019 (ADAMS Accession No. ML19247C384), and IMC 0611, "Power Reactor Inspection Reports," dated January 7, 2020 (ADAMS Accession No. ML19317F647), to close issues of very low safety significance that involve licensing-basis questions that cannot be resolved without significant effort early in the inspection process.

The staff used the VLSSIR process seven times in CY 2020 to close out issues. The staff has performed an effectiveness review of the VLSSIR process in early CY 2021 and has preliminarily concluded that overall the VLSSIR process is working as intended. The results of this effectiveness review will be included in the CY 2021 annual ROP self-assessment paper.

NRC 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 a lessons-learned tracker with a focus on timely evaluation and disposition. The staff closed 12 items from the lessons-learned tracker in CY 2020, and as of December 31, 2020, the tracker is following 43 open items, which include 13 items from the ROP implementation audit of Region IV, previously discussed under Element 1. This lessons-learned tracker, in conjunction with the ROP feedback form process, ensures that ROP improvement recommendations 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 current guidance in IMC 0307, the staff conducts a focused assessment on a triennial basis. The most recent ROP-focused assessment took place in CY 2018 on the topic of the emergency preparedness SDP so the staff did not perform a focused assessment in CY 2020. The planned comprehensive baseline inspection program review will serve as the focused assessment in CY 2021, in accordance with IMC 0307 and IMC 0307, Appendix B, "Reactor Oversight Process Self-Assessment Baseline Inspection Program Monitoring and Comprehensive Review."

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 began continuous monitoring in CY 2020. Continuous monitoring identified trends similar to those observed through other parallel efforts, including the decrease in the number of inspection findings for several IPs and the decrease in the number of inspection hours for several IPs. The staff plans to reevaluate the scope and periodicity associated with continuous baseline IP monitoring to ensure the efficient use of staff resources, avoiding duplicative ROP self-assessment activities.

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 11, 2020, the World Health Organization characterized the COVID-19 outbreak as a pandemic. On March 20, 2020, the NRC required mandatory telework for all non-mission-critical functions.

Despite the numerous challenges presented during CY 2020 by the COVID-19 pandemic, the regions, NRR, and NSIR successfully implemented newly developed guidance to accomplish both onsite and remote oversight activities at operating reactors during the COVID-19 PHE. The NRC staff continued to implement the baseline inspection program and initial operator licensing examinations, while taking precautions recommended by the Centers for Disease Control and Prevention to minimize exposure to COVID-19. Nationwide, the staff completed more than the minimum number of baseline inspection samples for most IPs in 2020. A few IPs, which included aspects of the refueling outage inspection and certain team inspections, were not performed due to the COVID-19 restrictions and were either not completed or rescheduled for a later time. The NRC achieved reasonable assurance of safe plant operation based on onsite RI presence and monitoring of plant activities in accordance with IMC 2515, Appendix D, "Plant Status," (ADAMS Accession No. ML20323A037) as well as inspectors' discussions with plant personnel; their review of plant records; the observation of overall plant performance, including findings, performance indicators, events, and equipment performance; and satisfactory completion of samples that were performed.

The NRC established a 17-member staff team in May 2020 to identify COVID-19 lessons learned and best practices and to make recommendations to improve readiness for future emergencies and nonemergency conditions. The team issued the "Initial Report on Challenges, Lessons Learned and Best Practices from the 2020 COVID-19 Pandemic and Associated Public Health Emergency: Focus on Regulatory Oversight of Operating Nuclear Reactors," in January 2021 (ADAMS Accession No. ML21003A006). The team concluded that the NRC's continued oversight of nuclear power reactors during the pandemic was appropriate considering the circumstances, mostly as a result of the NRC staff and management's ability to adapt to working remotely and the challenges the pandemic presented. NRC inspectors, staff, and management learned a great deal in a very short time, and implementation of actions from lessons learned and best practices identified should prove highly beneficial for future emergencies that limit or prevent access to nuclear plant sites. Staff continues to address the

issues coming out of the COVID-19 lessons-learned report and is currently prioritizing the recommendations in the report.

Inspection Findings Trend

NRR has been tracking a declining trend in green ROP inspection findings.² The average number of findings per site decreased by approximately 1.7 findings per site each year from 2015 through 2019. This trend continued through 2020, which finished with approximately 4.4 findings per site (2.6 findings per unit).

The staff's previous analysis of the downward trend in findings was summarized in SECY-20-0040, "Reactor Oversight Process Self-Assessment for Calendar Year 2019" (ADAMS Accession No. ML20037B156) and in its response to SRM-M190620, a memorandum titled "Analysis of Inspection Findings Trend at Nuclear Power Reactors between 2015 and 2018" (ADAMS Accession No. ML19225D281). The staff identified potential drivers for this downward trend in the adjustments to the implementation of the ROP inspection process including: additional training for inspectors and updated NRC guidance on backfit, cross-regional panels to review findings and internal decision-making, increased management oversight of the findings determination process, increased licensee engagement in the finding process, and updated guidance and inspector training on the minor/more-than-minor threshold.

Analysis has determined that the trend is independent of the reduction in the number of operating units and changes to specific IPs. NRR continues to monitor and evaluate trends in CY 2020 inspection findings to identify any potential influences from the COVID-19 PHE or ROP inspection guidance implemented during the PHE. The staff intends to update the Commission on its current analysis at the upcoming Commission briefing on the results of the Agency Action Review Meeting.

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 in this paper, analysis of the ROP performance metrics and the results of the ROP self-assessment program continue to indicate that the ROP is effective and is being implemented in accordance with program governance documents.

In addition to findings, PIs are another important assessment tool of the ROP that complements inspections and any resultant findings and would also indicate if 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. Review of indicators independent of the ROP, including scram trends and analysis provided by the Accident Sequence Precursor program (see the Accident Sequence Precursor Program 2019 Annual Report, ADAMS Accession No. ML20049G017), provide independent confirmation that the ROP is effectively maintaining reasonable assurance of adequate protection.

² These green ROP findings include both NRC-identified and self-revealed green findings, but do not include traditional enforcement violations, licensee-identified violations, minor violations, or observations.

Review of the Problem Identification and Resolution Inspection

In SECY-19-0067, “Recommendations for Enhancing the Reactor Oversight Process,” dated June 28, 2019 (ADAMS Accession No. ML19070A036), the staff informed the Commission that it would conduct a comprehensive review of the problem identification and resolution (PI&R) inspection described in IP 71152. The staff initiated this review because of extensive internal and external feedback on this inspection over the course of several years. In August 2019, the NRC assigned a multidisciplinary team of staff from several agency offices to conduct the review. The review focused on two main areas: (1) IP 71152 guidance and implementation, and (2) the NRC’s overall assessment of a licensee’s PI&R program. In November 2020, the team completed its review, which determined that IP 71152 is an effective oversight tool to assess the acceptability of licensee actions to identify, prioritize, evaluate, and correct plant problems. The team also concluded that there are opportunities to enhance the current procedure, including the guidance associated with NRC assessment of licensee corrective action programs. Therefore, the team identified several enhancements that could improve the overall effectiveness of the PI&R inspection program. The team’s report, charter, and other supporting documents are available (ADAMS Accession No. ML20247J590). The NRR Office Director is currently consulting with the Regional Administrators while considering the recommendations in the report in combination with recommendations discussed in “Effectiveness Review of the Cross-Cutting Issues Program” section above, given the two programs are complementary.

Construction Reactor Oversight Process

For CY 2020, the cROP continued to be successful in meeting its goals as intended and remained consistent with the NRC’s Principles of Good Regulation. The staff met all applicable construction self-assessment program metrics for CY 2020, as discussed in the “Construction Reactor Oversight Process Performance Metric Report for Calendar Year 2020,” dated January 19, 2021 (ADAMS Accession No. ML21011A213).

Established in early 2019, the Vogtle Project Office (VPO) is 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. During CY 2020, VPO staff finalized procedural steps and guidance to support the staff’s ability to make a first-ever finding under Title 10 of the *Code of Federal Regulations* (10 CFR) 52.103(g) in an effective and timely manner. The staff focused significant efforts on assessing program readiness and monitoring the effectiveness of previous program changes. In preparation for the end of Unit 3 construction and the expected surge of ITAAC closure notifications (ICNs), VPO maintains six dedicated ICN reviewers with approximately two dozen other qualified reviewers available if needed to ensure timely review of ICNs. In case the licensee identifies the need for additional licensing actions up until the 10 CFR 52.103(g) finding, VPO has established routine communications with the licensee’s licensing management to remain cognizant of changes that may necessitate late licensing actions and is maintaining a dedicated team of staff ready to conduct the necessary safety reviews in a timely manner.

The VPO and Region II staff continued to refine and test internal procedures in preparation for a possible 10 CFR 52.103(g) finding. The VPO staff conducted training for Region II inspectors to ensure that any technical issues identified late in the construction schedule are properly coordinated and prioritized to ensure timely resolution. Tabletop exercises were also conducted in early 2021 to work through a variety of scenarios to further prepare for the effective and timely handling of late construction or ITAAC inspection findings and late-filed allegations.

Region II is responsible for implementing the construction inspection program. To date, the staff has performed over 45,500 direct inspection hours at Vogtle Units 3 and 4, with no findings of GTG significance. Due to restrictions resulting from the Federal, State, and local response to the COVID-19 PHE, Region II adapted the inspection program to ensure its effectiveness while protecting the health and safety of inspectors. As a result, construction inspectors have primarily conducted inspections remotely during the PHE. Inspectors have conducted onsite inspections of ITAAC, the Initial Test Program, and operational programs based on safety significance and the uniqueness or complexity of the construction activity. For example, over the summer of 2020, inspectors were on site to inspect portions of the conical roof installation, integrated leak test, and structural integrity test for Unit 3.

The memorandum titled, "Update to Targeted Inspection, Tests, Analyses and Acceptance Criteria for Vogtle Electric Generating Plant, Units 3 and 4," dated February 10, 2020 (ADAMS Accession No. ML19329C875), describes staff actions to un-target ITAAC that had low-risk and low inspection value and eliminate duplicative inspections of the same activity. Throughout CY 2020, the staff made adjustments similar to this targeted ITAAC optimization initiative to enhance inspection flexibility at Vogtle, focusing inspection resources on risk significant areas and eliminating redundant inspections, based upon licensee performance, lessons learned, and inspection results.

For public transparency, the staff continued to provide monthly resource expenditure reports on the NRC's public Web site and completed enhancements to the Web pages to improve clarity and navigation. VPO and Region II ensured the proper use of program resources by critically reviewing the expenditure reports and adjusting resources accordingly, such as by analyzing direct and indirect charges for the inspection staff and revising associated charge codes for more accurate tracking of expenditures. To continue promoting public engagement, staff conducted routine, nearly weekly public meetings to discuss licensing activities and issues related to ITAAC for the Vogtle project. Staff also conducted a public meeting to communicate the Vogtle Readiness Group's activities, which was formed to coordinate and oversee construction completion at Vogtle Units 3 and 4.

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 programs. The staff effectively implemented the construction SDP in support of the cROP goals to be objective, predictable, understandable, and open. As a result, the staff did not make any significant changes to the construction assessment and enforcement programs in CY 2020.

Reactor Oversight Process for New Reactors

In CY 2019, the staff developed the baseline inspection program for the AP1000 design. Compared to a traditional large pressurized-water reactor, the AP1000 design has fewer components on which to conduct inspection samples, because it uses passive safety features and its active defense-in-depth systems are not considered safety-related. Additionally, the AP1000 design has core damage frequencies that are lower than those of current operating reactors. Accordingly, the staff planned to adjust sample sizes for the AP1000 design for many baseline IPs.

In CY 2020, the staff issued SECY-20-0050, "Planned Revisions to the Baseline Inspection Program for the AP1000 Reactor Design," dated June 2, 2020 (ADAMS Accession No. ML20058F491), to inform the Commission of the staff's planned revisions to the baseline

IPs to ensure adequate oversight during operation of the newly constructed AP1000 reactor units at Vogtle.

In 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 September 12, 2018 (ADAMS Accession No. ML17166A238), the staff notified the Commission that guidance for the Unplanned Scrams with Complications PI would need to be modified to account for the AP1000 reactor design. The Nuclear Energy Institute has submitted a white paper, "Modification of the Description of Unplanned Scrams with Complications Performance Indicator to Reflect AP1000 Design," dated November 17, 2020 (ADAMS Accession No. ML20322A339), describing proposed changes to that guidance. The staff has reviewed and approved the proposed changes as documented in Performance Indicator Frequently Asked Question 21-01, "Unplanned Scrams with Complications for AP1000" (ADAMS Accession No. ML21028A391).

Modernizing Reactor Oversight Process Inspection and Assessment through Data Analytics

In CY 2020, the staff continued to make enhancements to RPS. One enhancement of note established a tracking mechanism for the follow-up inspection of corrective actions to prevent recurrence for GTG inspection findings. This will help ensure documentation of these completed corrective actions in subsequent inspection reports. Another modification was the streamlining of the finding and violation documentation system. This modification removed redundant options and clearly aligned the selection options with those from IMC 0611, improving the usability of the system. The staff had also been working to improve the quality of the data extracted from the system by improving quality assurance practices for the system. The improved output reports have supported the identification of data entry errors and the utilization of the data for visualizations and dashboard to communicate applicable trends in findings. Another noteworthy enhancement was the expansion of the system to better support other NRC business lines, such as the research and test reactors and fuel facilities.

NRR and regional staff were successful in greatly enhancing the processing and display of ROP related information. Staff continues efforts to improve overall agency displays via participation in the core team of the Mission Analytics Portal project. In addition, staff have developed and deployed dashboards for inspection findings, operating experience, industry scram trends, and current impacts of the COVID-19 pandemic. To monitor information important to the overall ROP, the staff developed and deployed the Operating Reactor Inspection and Oversight Dashboard. This module collects and displays information critical to the ROP from multiple systems and includes summary information and detailed drilldowns for several areas. Areas of focus include ROP completion; action matrix status and historical trends; trends in event reporting, scrams, and findings; budget utilization; and operator licensing. The continuous monitoring of data indicative of ROP health ensures that any significant trends are identified and addressed in a timely manner. This was an area of emphasis for the staff in CY 2020 and will continue to be so in the future.

Resident Inspector Demographics and Site Staffing

The staff reviewed RI and senior resident inspector (SRI) demographics in accordance with IMC 0307, Appendix D, “Power Reactor Resident Inspector Retention and Recruitment Program Monitoring and Assessment,” dated May 21, 2019. Based on this review, the staff concluded that the sites continue to be staffed with knowledgeable and experienced RIs and SRIs. The staff noted a few challenges with site coverage in CY 2020, due in part to the COVID-19 PHE. The staff turnover rate for the SRI ranks increased in CY 2020 compared to recent years as did the percentage of days when a permanent RI or SRI was not assigned to a site. These increases will be monitored closely in CY 2021 to determine whether these increases indicate an adverse trend. The staff will continue to closely monitor inspector experience, inspector turnover, and permanent site staffing in CY 2021. As discussed in COMSECY-15-0004, “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 will continue to analyze RI and SRI demographics on a triennial basis and plans to provide the next update in the CY 2023 ROP self-assessment paper. Enclosure 2 to this paper provides details on the CY 2020 RI and SRI demographics and site staffing.

In response to SRM-SECY-19-0002, “Staff Requirements—SECY-19-0002—Implementation of Changes to the Resident Inspector Program,” dated May 22, 2020 (ADAMS Accession No. ML20147A077, non-public), the staff issued SECY-20-0107, “Recommendations for Addressing Resident Inspector Recruitment and Retention Challenges,” dated November 19, 2020 (ADAMS Accession No. ML20258A037, nonpublic), requesting Commission approval of recommendations to revise policies and practices to address recruitment and retention challenges in the RI program. The Commission approved the staff’s recommendations in SRM-SECY-20-0107, dated February 19, 2021 (ADAMS Accession No. ML21050A268, nonpublic).

Planned ROP Self-Assessment Activities in Calendar Year 2021

The staff has planned several ROP self-assessment activities and other related activities for CY 2021 that the staff plans to discuss in the CY 2021 annual ROP self-assessment paper:

- The staff plans to perform an effectiveness review of the new VLSSIR process under Element 2 of the ROP self-assessment process to ensure that the intended results have been realized and to evaluate any unintended consequences.
- The staff plans to perform a comprehensive baseline inspection program review under Element 3 of the ROP self-assessment process. This review would be credited for the CY 2021 triennial focused assessment.
- The staff plans to continue to monitor the trend in inspection findings in CY 2021, including any potential impacts resulting from the decline in inspection findings. The staff also plans to determine whether programmatic adjustments should be made to ensure continued effective implementation of the ROP.
- The staff plans to conduct a focused cROP lessons-learned effort in CY 2021 on the construction experience from Vogtle and the Virgil C. Summer Nuclear Station for knowledge management and use in advanced reactors licensing and oversight.

- As directed in SRM-SECY-18-0091, dated February 24, 2020 (ADAMS Accession No. ML20055G004), after the initial operation of the first AP1000 unit at Vogtle, the staff plans to review and report on any insights, trends, or lessons learned in applying this modified ROP for AP1000 units. 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 2020 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 2020 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 2020 ROP self-assessment in accordance with IMC 0307 and its appendices, and in accordance 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.

Margaret M. Doane Digitally signed by Margaret M. Doane
Date: 2021.04.01 11:51:28 -04'00'

Margaret M. Doane
Executive Director
for Operations

Enclosures:

1. CY 2020 ROP Program Area Evaluations
2. CY 2020 ROP RI Demographics (non-public)

SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR CALENDAR
YEAR 2020 DATED: April 1, 2021

Ticket No.: 201100134

Package No.: ML21057A137
SECY No.: ML21057A169
Enclosure 1 No.: ML21057A178
Enclosure 2 No.: ML21057A168

SECY-012

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DATE	03/17/2021	02/18/2021	02/22/2021	02/12/2021	02/19/2021
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DATE	02/23/2021	03/11/2021	03/16/2021	03/23/2021	04/01/21

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