POLICY ISSUE
(Notation Vote)

June 28, 2019 SECY-19-0067

FOR: The Commissioners

FROM: Margaret M. Doane
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SUBJECT: RECOMMENDATIONS FOR ENHANCING THE REACTOR OVERSIGHT PROCESS

PURPOSE:

The purpose of this paper is to request Commission approval of recommendations to enhance the Reactor Oversight Process (ROP). The U.S. Nuclear Regulatory Commission (NRC) staff developed these recommendations based on suggestions from both internal and external stakeholders on ways to make the ROP more risk-informed and performance-based. This paper also informs the Commission of other ROP enhancements that the NRC staff is planning to implement that require Commission notification. Finally, this paper describes longer-term ROP enhancement activities being considered to address stakeholder suggestions.

SUMMARY:

This paper summarizes the staff's review of recommendations resulting from the NRC's Transformation Initiative, stakeholder correspondence, and feedback from ROP public meetings. The review identified several ROP enhancements that require Commission approval, some enhancements that require Commission notification prior to implementation, and some actions that can be implemented by the staff without Commission approval or advanced notification, in accordance with the guidelines in Management Directive (MD) 8.13,

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"Reactor Oversight Process," dated January 16, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17347B670).

Stakeholder feedback generally indicated that the ROP is a highly effective oversight program. As such, all the actions identified in this paper are better characterized as targeted refinements to specific areas. In addition to these targeted enhancements, the staff's review of the ROP, including consideration of stakeholder recommendations, assisted in reinforcing the fundamental principles of the ROP.

Further, in keeping with the transformational spirit of the staff's review of the ROP, alternative views were carefully considered and are thoroughly evaluated in the paper. Overall, however, there was still wide agreement among the staff that the proposed changes are consistent with the NRC's Principles of Good Regulation and will ensure that the ROP continues to provide appropriate oversight.

The paper itself describes recommendations requiring Commission approval and notification, while the enclosures provide additional information on the issues discussed in the paper, describe any planned changes or completed staff actions that did not meet the criteria for approval or notification, and discuss the status of recommendations still under consideration. Some proposals under consideration by the staff require additional internal discussion and stakeholder interaction. These proposals will be dispositioned later.

Commission Notification Item

There is currently a required summer readiness inspection sample under Inspection Procedure (IP) 71111.01, "Adverse Weather Protection," for inspectors to verify that the licensee's procedures and associated plant features for operation of both offsite alternating current (AC) power systems and the onsite alternate AC power systems appropriately address measures to monitor and maintain continued availability and reliability. The staff determined that this required sample is no longer warranted. In addition to reviewing this issue through plant status walkdowns, other Federal entities with regulatory jurisdiction over the national electric grid have increased oversight and coordination with utilities since implementation of the required sample in 2007. Further, actions taken in response to open phase circuits and the industry's diverse and flexible coping strategies (FLEX) have mitigated the risk in this area.

Commission Approval Items

The staff is providing options and recommendations to the Commission for approval in three areas:

(1) Assessment Area: The staff is recommending two changes in the assessment area. The first is to remove greater-than-Green (GTG) inspection findings as ROP Action Matrix inputs upon successful completion of the appropriate supplemental inspection. Currently, these findings remain as Action Matrix inputs for at least four full calendar quarters. The second staff recommendation is to revise the treatment of GTG performance indicators (PIs) such that they remain Action Matrix inputs until the appropriate supplemental inspection is successfully completed. Currently, if a PI returns to Green, it is no longer an Action Matrix input, so it does not aggregate with other GTG inputs, even though the licensee remains in the higher Action Matrix column until the supplemental inspection is completed.

(2) Inspection Area: The staff is recommending revisions to sample sizes and resource estimates for several baseline inspection procedures. The staff is also recommending revising the frequency of the problem identification and resolution (PI&R) inspection from a biennial to a triennial inspection.

(3) Emergency Preparedness (EP) Area: The staff is recommending a revision to the EP significance determination process (SDP) such that only those planning standard (PS) functions that have an impact on public health and safety would have performance deficiencies assessed to have GTG safety significance.

Under MD 8.13, the proposed, individual changes to inspection procedures generally require Commission notification and not approval. However, the staff is seeking Commission approval because these changes, when considered in the aggregate, are considered significant. In addition, the staff is requesting approval to revise the Enforcement Policy, dated May 15, 2018 (ADAMS Accession No. ML18138A138), to make conforming changes to the qualitative description of a White inspection finding from "low-to-moderate" to "low" safety significance and to change the description of a Yellow inspection finding from "substantial" to "moderate" safety significance.

BACKGROUND:

The NRC's Executive Director for Operations established the Transformation Team in a memorandum dated January 25, 2018 (ADAMS Accession No. ML18029A106), tasking the team with identifying potential transformational changes to the NRC's regulatory framework, culture, and infrastructure to further enhance effectiveness, efficiency, and agility in regulating novel technologies, as described in the team's charter, dated February 22, 2018 (ADAMS Accession No. ML18044A984, not publicly available). The team provided the Commission the results of its review in SECY-18-0060, "Achieving Modern Risk-Informed Regulation," dated May 23, 2018 (ADAMS Accession Package No. ML18110A186).

As discussed in SECY-18-0060, the team solicited feedback from both internal and external stakeholders to inform its evaluation. Feedback that was not within the scope of the review was referred to other NRC organizations for consideration. The team received 72 recommendations for improvements to the ROP, which were provided to the Office of Nuclear Reactor Regulation (NRR) for its consideration (ADAMS Accession Package No. ML18292A594).

On September 19, 2018, the Nuclear Energy Institute (NEI) submitted a letter to the Director of NRR to consolidate and prioritize NEI's recommendations to enhance the ROP (ADAMS Accession No. ML18262A322). NEI's letter provided a perspective that the ROP remains sound, that it is an effective model for regulatory oversight, and that "the fundamental structure of the ROP played an important part in incentivizing good performance and focusing NRC resources on departures from desired performance." The letter offered 27 recommendations described by NEI as consistent with the NRC's Principles of Good Regulation and that would "promote prompt resolution of issues and returning the plant to its baseline risk profile as soon as practical."

DISCUSSION:

The NRC staff established a multidisciplinary and cross-organizational team to assess the recommendations from the NRC's Transformation Team and NEI. The team charter

(ADAMS Accession No. ML19091A042) directed staff efforts to evaluate the recommendations and propose resolutions consistent with the NRC's Principles of Good Regulation.

Review Approach

The staff consolidated the recommendations into the following thematic areas and established a working group for each area:

- Assessment area
- Inspection area
- SDP area
- Performance Indicator area
- EP area
- Radiation Protection area
- Security area
- Independent Spent Fuel Storage Installation area

Enclosures 1–8 describe staff evaluations and planned changes or completed staff actions in the thematic areas that did not meet the criteria for approval or notification. Enclosure 9 discusses the staff's data analysis to support changes in the assessment area. Enclosures 1, 2, 5, 6, and 9 support staff recommendations described in this paper.

Recognizing that some of the recommendations would require extensive analysis to disposition, the staff's objective in completing this paper was to identify near-term improvements to the ROP, defined in the charter as those that could be dispositioned in the first six months; these improvements are the subject of this paper. The staff plans to evaluate longer-term ROP enhancements and will engage with the Commission if the staff recommends further changes to the ROP.

To ensure regional perspectives were fully considered, senior managers from each of the NRC's four regional offices were selected to form a Regional Advisory Panel (RAP). The RAP provided regional input and advice to NRR on the areas being considered for change. Experienced regional inspection staff, including inspectors with specific inspection expertise in the relevant areas, supported the work of the RAP. The staff used the Advisory Panel's feedback to evaluate each recommendation.

To complement the ROP enhancement effort, the staff reviewed operating experience information, inspection program data, information from the sunset Industry Trends Program, and other information sources from 2000-2018 to independently assess whether the safety of the operating reactor fleet has demonstrably changed over the life of the ROP. Plant modifications during that time have generally resulted in reduced baseline core damage frequencies for internal events. The staff concluded that there has been an improvement in plant safety over the period for several areas considered.

Overall, the staff's proposed changes to the ROP that are discussed in this paper are targeted enhancements to an already effective oversight process. The development of these enhancements also allowed the staff to refocus on ROP fundamentals and reaffirm effective aspects of the existing process. The staff ensured all recommended changes were consistent with the NRC's Principles of Good Regulation.

Stakeholder Interactions

The staff discussed the status of its review and sought feedback on its proposed resolutions to recommendations from internal and external stakeholders, including the regions, the industry, members of the public, and nongovernmental organizations. The staff hosted public meetings on June 25, 2018 (ADAMS Accession No. ML18211A470); September 20, 2018 (ADAMS Accession No. ML18271A089); November 15, 2018 (ADAMS Accession No. ML18348B256); December 13, 2018 (ADAMS Accession No. ML18353A800); December 14, 2018 (ADAMS Accession No. ML18355A510); January 10, 2019 (ADAMS Accession No. ML19036A562); January 17, 2019 (ADAMS Accession No. ML19044A692); February 28, 2019 (ADAMS Accession No. ML19060A128); March 7, 2019 (ADAMS Accession No. ML19088A137); March 27, 2019 (ADAMS Accession No. ML19113A034); and April 24, 2019 (ADAMS Accession No. ML19134A334). Stakeholder views on the proposed resolutions are provided for each recommendation below, as well as in the enclosures.

Aggregate Impact of Proposed Changes to the ROP

The staff reviewed the aggregate impact of all the proposed actions discussed in this paper. The staff concluded that several proposed staff actions could have some regulatory impact, specifically the potential for fewer GTG inspection findings, with a subsequent reduced likelihood of licensees moving to Column 3 or 4 of the Action Matrix because of the reduced time in which safety-significant inputs may aggregate. The reduced aggregation impact is mitigated by the recommendation to maintain PIs as Action Matrix inputs pending successful completion of the appropriate supplemental inspection. The staff concluded that the aggregate impact of the proposed changes would result in an improved ROP that is better aligned with the NRC's Principles of Good Regulation. Finally, these changes will result in the staff performing an appropriate level of oversight with less regulatory burden and expenditure of resources by focusing oversight on issues of greater safety significance.

NRC Response to White Inspection Findings

The general feedback from industry stakeholders was that the NRC's response to White findings is not commensurate with the safety significance of the issues. This includes the issuance of press releases, the qualitative description of White (and Yellow) findings, outreach to State Governors, and the scope and depth of supplemental inspections. The staff agreed in part with some of the recommendations and has taken, or plans to take, certain actions not requiring prior Commission notification or approval, in the near term in response to the feedback, including:

- The staff worked with the NRC's Office of Public Affairs to reinforce the existing guidance with respect to issuing press releases for White inspection findings. Guidance states that press releases are not normally issued for White inspection findings; however, the guidance was inconsistently applied. This effort aligns with the clarity and reliability Principles of Good Regulation.

- The staff plans to revise the qualitative descriptions of White and Yellow inspection findings by changing the description of a White finding from "low-to-moderate" safety significance to "low" safety significance. In addition, the staff plans to change the description of Yellow findings from "substantial" safety significance to "moderate" safety significance. No change is planned to the description of Green or Red inspection findings. These changes will more closely align the characterization of the safety

significance of inspection findings with the qualitative descriptions of the Action Matrix columns but will not affect the existing risk thresholds established by the Commission. There will be no impact on licensee placement in the Action Matrix. The staff plans to make conforming changes to the qualitative descriptions of the Action Matrix columns to maintain consistency. The staff notified the Commission of this change in a Commissioner Assistants' Note dated April 2, 2019 (ADAMS Accession No. ML19029A704, non-public).

- The staff evaluated a recommendation to consider eliminating outreach to State Governors when a licensee moves to Column 2 of the Action Matrix. Per the current Action Matrix, State Governors shall be notified of a move to Column 2 based on a security-related issue; the staff is not proposing to change this requirement. The staff agrees that mandatory outreach to State Governors for all Column 2 plants may not be necessary for non-security-related White findings. However, given the range of performance that may be represented by plants in Column 2, as well as the case-specific level of interest in licensee performance by State governments, this type of engagement may still be appropriate. The Column 2 outreach to external stakeholders would be revised from the current "State Governors" to "outreach to State, local, and Tribal officials based on established protocols with external stakeholders," with no proposed change to required notification for security-related issues. This change is consistent with the openness and clarity principles of good regulation.

- The staff plans to revise Inspection Procedure (IP) 95001, "Supplemental Inspection Response to Action Matrix Column 2 Inputs," dated August 24, 2016, to clarify the expectation for inspectors to review causal evaluations for all White Action Matrix inputs. In addition, the staff plans to revise the resource estimate from 40–120 hours to 16-120 hours. The revised lower range is to realign with the original estimates to close uncomplicated White inputs, while the upper range applies to more complicated issues, or when multiple White Action Matrix inputs overlap. This change is aligned with the efficiency principle of good regulation.

Commission Approval Items

1. Assessment Area

In evaluating this area, the staff gathered feedback from both internal and external stakeholders. Several recommendations were directed at how the NRC responds to White inspection findings, and the NRC's treatment of GTG PIs. Planned staff actions not requiring prior Commission notification or approval are discussed in Enclosure 1.

In addition to the changes not requiring prior Commission notification or approval, the staff also considered two options that require Commission approval: (1) eliminate the minimum four-quarter requirement for GTG inspection findings with no change to PIs; and (2) eliminate the minimum four-quarter requirement for GTG inspection findings and revise GTG PI treatment. Specifically, Option 2 would modify the existing treatment of GTG PIs, such that they remain as Action Matrix inputs until the associated supplemental inspection is completed. The staff also recommends approving a revision to the Enforcement Policy to make conforming changes to the qualitative descriptions of White and Yellow inspection findings.

Both options recommend eliminating the four-quarter requirement for inspection findings. Currently, GTG inspection findings remain open in the assessment process for at least four full

calendar quarters, even if the staff completes the supplemental inspection sooner. This requirement was originally established to allow these findings to accumulate with other GTG findings and PIs, which may indicate more significant performance problems that require an increased level of NRC oversight. The proposed change to the minimum four-quarter requirement in both Option 1 and Option 2 is in response to an industry recommendation to promptly close White findings upon successful completion of a supplemental inspection.

In evaluating potential changes to the treatment of GTG PIs and findings, the staff considered a "no change option," i.e., maintain the status quo, but does not recommend pursuing this option because it does not address the desire to provide a performance-based incentive for licensees to address associated issues to allow NRC to complete supplemental inspections for GTG issues in a timely manner commensurate with the safety significance. As such, the staff is proposing the following options for Commission consideration:

Option 1: Eliminate the minimum four-quarter requirement for inspection findings; make no change to PIs.

This option would eliminate the minimum four-quarter requirement for GTG inspection findings, allowing them to be closed and no longer considered Action Matrix inputs upon satisfactory completion of the appropriate supplemental inspection.

Pros:

- This option provides an incentive to licensees to correct GTG findings and prepare for supplemental inspections in a more timely manner, consistent with the significance of the input. Satisfactory completion of supplemental inspections provides assurance that licensees have taken appropriate corrective actions for the issue.
- This option is responsive to external stakeholder feedback regarding timely closure of GTG inspection findings.
- The assessment process will be more effective, and will reflect actual, real-time licensee performance because GTG findings that have been corrected and inspected indicate that the plant risk profile has returned to baseline risk.
- Analysis of the change based on historical data shows that negative impacts (i.e., reduced Action Matrix movement caused by decreased aggregation) should be small. However, it is impossible to predict future licensee performance based on this change. The deviation process exists for cases where licensee performance is not consistent with Action Matrix placement.
- The elimination of the minimum four-quarter requirement is consistent with the efficiency and reliability Principles of Good Regulation.

Cons:

- Licensees could assert undue pressure on the regions to schedule and complete supplemental inspections more quickly.
- This change could be construed as a relaxation of regulatory oversight by reducing the time for aggregation of Action Matrix inputs. This could potentially impact the ability to detect more pervasive and significant performance problems that require an increased level of oversight.

- There is an increased potential for the supplemental inspection not to be completed successfully on the first attempt if licensees are not fully prepared to quickly close out the GTG finding.
- This option alone does not address the inconsistent and complicated treatment of PIs that cross a significance threshold.

Option 2: Eliminate the minimum four-quarter requirement for inspection findings; revise PI treatment.

In this option, the staff would eliminate the minimum four-quarter requirement for GTG inspection findings and establish consistent treatment for GTG PIs. To enact this change, the staff would open a parallel inspection finding for any GTG PI, which would then be the Action Matrix input until the appropriate supplemental inspection is successfully completed.

Pros:

- This option provides an incentive to licensees to correct GTG findings and PIs and declare readiness for supplemental inspections as soon as practicable. Satisfactory completion of supplemental inspections provides assurance that licensees have taken appropriate corrective actions for the issue.
- The assessment process will be more reflective of actual, real-time licensee performance because GTG PIs and findings that have been corrected and inspected with successful closeout indicate that the plant risk profile has returned to baseline risk.
- GTG inspection findings and PIs would be treated consistently.
- The parallel finding remains as an input even if the PI returns to Green, clearly communicating to the public why the licensee remains in the higher Action Matrix column.
- Treatment of PIs would be simplified, aligned with improving NRC performance as it pertains to the Principles of Good Regulation of efficiency, reliability, and clarity.

Cons:

- Regions may need to be ready for certain supplemental inspections in a shorter period of time.
- The proposed change eliminating the minimum four-quarter requirement change for findings could be construed as a relaxation of regulatory oversight by reducing the time for aggregation of Action Matrix inputs; however, net impact would be neutral when considering the proposed change to the treatment of GTG PIs.
- There is an increased potential for the supplemental inspection not to be completed successfully on the first attempt if licensees spend less time in analyzing and completing corrective actions while preparing to close out the GTG finding.

Stakeholder Views Regarding Assessment Program Changes

Although the industry expressed support for the proposal to close White findings upon satisfactory completion of the supplemental inspection, industry representatives oppose changing the treatment of PIs such that they remain Action Matrix inputs until the supplemental inspection is completed, and in particular after the PI returns to Green. During a public meeting held on April 24, 2019, NEI stated that PIs are meant to report current performance; if a PI is Green, it indicates nominal performance and the PI should not count as an Action Matrix input.

However, the staff notes that a PI could return to Green without the licensee taking corrective action, or if the corrective actions implemented were not verified to be adequate. This could result in the PI crossing the Green/White threshold again before the supplemental inspection was completed. There have been eight times where a PI crossed the White threshold, returned to Green, and subsequently returned to White before completion of the supplemental inspection, or shortly thereafter. As discussed above, GTG inspection findings continue to count as Action Matrix inputs until the licensee has corrected the underlying cause of the issue and the staff believes it should treat PIs the same way. During the April 24, 2019 public meeting, industry representatives stated that PIs and inspection findings were never intended to be treated the same when the ROP was developed, but provided no additional information to support that assertion. The industry's view is not consistent with Inspection Manual Chapter (IMC) 0308, "Reactor Oversight Process Basis Document," which states that "[c]rossing a PI threshold and an inspection threshold will have the same meaning with respect to safety significance and directly define the level of NRC involvement and action." The staff also notes that this change would benefit a licensee in cases where a supplemental inspection has been completed for a PI that remains White. In those cases, the White PI would not be considered an Action Matrix input since the licensee would have taken effective corrective action, while it would remain an Action Matrix input under the current process. NEI provided a letter, dated May 20, 2019 (ADAMS Accession No. ML19141A143), describing their objections to the proposed changes to the treatment of GTG PIs.

One staff member expressed the view that a PI that crosses a significance threshold should continue to remain an Action Matrix input even if the supplemental inspection has been completed for that issue if the PI has not returned to Green. The view is that the proposed approach would remove a quantitative Action Matrix input (a GTG PI) based on qualitative inspection conclusions, and it has the potential to weaken the assessment process by introducing staff judgment, in the form of qualitative inspection conclusions, in place of the PIs. However, other staff members have expressed the view that since GTG inspection findings are closed based on qualitative inspection conclusions, then GTG PIs should be closed on that same basis. Supplemental inspections are completed in both cases, ensuring the licensee has adequately addressed the causal factors that resulted in the significant Action Matrix inputs.

Some staff members have expressed a concern that eliminating the minimum four-quarter requirement would result in licensees pressuring the regions to complete supplemental inspections more quickly, creating challenges with inspection scheduling. Data analysis shows the average time from licensee notification of readiness until satisfactory completion of the supplemental inspection is 63 days for GTG findings, and 71 days for PIs. The staff will explore ways of improving NRC inspector responsiveness to conducting supplemental inspections if this becomes an issue.

During the March 27, 2019 public meeting, a member of the public stated that NRC appeared to be reducing the significance of White and Yellow inspection findings by taking the proposed actions, and did not agree with the staff's recommendations, including the staff's proposed action to remove the requirement to notify State governors on the issuance of White findings.

Staff Recommendation for Assessment Program

The staff recommends that the Commission approve Option 2. Both options provide an incentive for licensees to declare readiness for supplemental inspections as soon as practicable, potentially improving safety. Revising the treatment of PIs that cross a significance threshold would add consistency, clarity, and predictability to the assessment process. The

changes, if implemented together, would simplify the assessment process in that Action Matrix inputs would all be treated the same. Both changes are aligned with the principles of clarity, reliability, and efficiency.

The staff also recommends that the Commission approve a revision to the Enforcement Policy to make conforming changes to the qualitative descriptions of White and Yellow inspection findings.

Staff Analysis Supporting Recommendation for Assessment Program

Response to White Findings

To fully assess the merits of the proposal to promptly close White findings upon successful completion of a supplemental inspection, the staff conducted an analysis of the historical performance in completing supplemental inspections for GTG inspection findings. The results of the staff's analysis are provided below, with details provided in Enclosure 9:

- An analysis of the timing of supplemental inspections shows that 75 percent of all supplemental inspections to close White inspection findings were completed in four or more quarters. 28 percent of all White findings were closed in five or more quarters.

- The staff evaluated the potential impacts if the minimum four-quarter requirement had not existed when the ROP was implemented. The staff reviewed the performance of 75 reactor units that transitioned to Column 3 (Degraded Performance column) of the Action Matrix because of aggregating White inputs and concluded that, since the inception of the ROP, only three reactor units would not have transitioned to Column 3 if the first White input had been closed before the fourth quarter. However, because the definition of a degraded cornerstone changed in 2016 from two White inputs to three White inputs in the same cornerstone, none of those units would have met the new criteria for Column 3. The staff acknowledges that, because there was no incentive to complete supplemental inspections sooner, the analysis may not be completely representative of what licensee behavior might have been had the incentive been in place. There would have been no impact on licensees moving to Column 4.

- The average NRC response time from licensee notification of readiness until satisfactory completion of the supplemental inspection is 63 days, under a timeliness metric of 180 days.

With 75 percent of all supplemental inspections for White findings taking four or more quarters to complete, the staff agrees with the recommendation to close GTG findings after successful completion of the supplemental inspection because elimination of the minimum four-quarter requirement would provide an incentive for licensees to address the issues that caused the findings and to declare readiness for NRC inspection as soon as practicable. The staff has concluded that safety is improved when the licensee completes the causal analysis and implements corrective actions as soon as practicable, and the NRC completes the supplemental inspection to verify the corrective actions are adequate. To address situations where multiple GTG Action Matrix inputs occur during a short period, potentially indicating a more significant performance problem, the staff would add guidance to the supplemental inspection procedures to allow for a review of potential common causes of all safety-significant inputs within a specified period, e.g., the last four quarters.

Proposed Treatment of Performance Indicators

Licensee incentive to address issues that caused a PI to exceed the Green/White threshold and to declare readiness for NRC inspection sooner could be enhanced in a similar way. In the current program, GTG PIs are not treated the same way as GTG inspection findings. For example, if a PI exceeds the Green/White threshold, the licensee moves to Column 2 (Regulatory Response column) of the Action Matrix, and the PI may aggregate with other safety-significant inputs. The licensee is subject to a supplemental inspection to review its corrective actions to address the White PI, exactly like a White inspection finding. However, if the PI returns to Green, it no longer counts as an Action Matrix input and will no longer aggregate with other GTG inputs, even if the licensee has taken no corrective actions to address the underlying cause of the PI exceeding the White threshold. The licensee remains in Column 2 of the Action Matrix until completion of the supplemental inspection, but there would be no White Action Matrix inputs. If the licensee subsequently fails to meet the objectives of the supplemental inspection, then the staff opens a parallel White finding backdated to the time when the PI returned to Green. In this case, it is possible that the licensee might have moved to a higher column in the Action Matrix if other safety-significant inputs were present, and several quarters may have passed before the declining performance was identified in the ROP. The staff believes that the current process is overly complicated, inconsistent with the clarity and efficiency Principles of Good Regulation, and does not provide the proper incentive for licensees to address the associated issues to allow NRC to complete the supplemental inspection in a timely manner commensurate with the safety significance.

After evaluating current practices and the associated data, the staff proposes to modify the existing treatment of GTG PIs, such that they remain as Action Matrix inputs until the associated supplemental inspection is completed. The staff believes this will provide an incentive for licensees to declare readiness for the supplemental inspections for PIs that cross a significance threshold as soon as practicable to remove the Action Matrix input. Once the supplemental inspection is completed satisfactorily, the licensee would return to Column 1 (the Licensee Response Column) in situations where there were no other GTG PIs or inspection findings, even if the PI had not returned to Green. If inspectors verify that the licensee has identified the causal factors and appropriate corrective actions for the PI crossing the significance threshold, then the issue should no longer be an Action Matrix input, the same as the staff recommended treatment of GTG inspection findings. Under the revised approach, once a PI crosses a significance threshold, the staff would open a parallel finding with the same color as the PI. This parallel finding would replace the PI as the Action Matrix input and would remain open until the supplemental inspection is successfully completed. The staff believes that this change is more consistent with IMC 0308, which states that "[c]rossing a PI threshold and an inspection threshold will have the same meaning with respect to safety significance and directly define the level of NRC involvement and action."

The staff analyzed licensee historical performance in addressing GTG PIs using the same methodology as that used to evaluate the recommended change to the four-quarter requirement for findings. The results of the staff's analysis are provided below, with details in Enclosure 9:

- Of the 132 licensees that had a White PI, 127 would not have been affected by the proposed change because there were no additional Action Matrix inputs, or there would have been no change in the Action Matrix column if the PI had remained an Action Matrix input until completion of the supplemental inspection.
- The effect of this proposed revision to treatment of GTG PIs is that they will be allowed to aggregate with other Action Matrix inputs that could result in licensees moving to

higher columns of the Action Matrix. The staff identified five licensees that would have transitioned to higher columns in the Action Matrix had this policy been in place since ROP inception under the original definition for a Degraded Cornerstone, i.e., two White inputs in the same cornerstone, and subject to an IP 95002, "Supplemental Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," supplemental inspection. However, these licensees would not have transitioned to Column 3 of the Action Matrix under the current criteria, i.e., three White inputs in the same cornerstone. Therefore, the staff concluded the historical impact would have been minor.

- The staff reviewed supplemental inspection completion data for all White PIs, and found that overall, 58 percent were completed in four or more quarters from the time the PI became White. In two extreme cases it took nine quarters for the supplemental inspection to be completed.

- The staff has assigned six parallel White findings to licensees who were unable to satisfactorily complete the objectives of the supplemental inspection for a PI that crossed a significance threshold. In one of those cases, the licensee moved to Column 4 because of additional Action Matrix inputs.

- The time it takes for licensees to declare readiness for supplemental inspections for White PIs has been increasing, from an average of 180 days to an average of 318 days, counting from the first date of the quarter in which the PI was reported as White.

2. Inspection Area

Background on ROP Resource Estimates

Several recommendations, from internal and external stakeholders, were directed at improving the inspection program. The industry recommended that the NRC reduce the baseline inspection program by 20 percent. Several other recommendations stated that the review approach recently used in the engineering inspection area, described in more detail in Enclosure 2, could be applied to all inspection areas to improve efficiency and effectiveness.

To provide some perspective, the yearly resource estimates[1] to complete the baseline inspection program increased over 10 percent since the ROP's inception, largely based on increased oversight in the security and EP areas after the 9/11 terrorist attacks. During the same period, industry operating performance has improved, as shown by data such as fewer reactor scrams, fewer GTG PIs, lower collective radiation dose, and results from the accident sequence precursor program. In light of these conditions, the staff reviewed the baseline inspection program to determine if there were opportunities to increase the efficiency and effectiveness of the program in alignment with the Principles of Good Regulation.

The following table[2] summarizes the historical and current annual nominal resource estimates for a two-unit pressurized-water reactor facility and the staff's proposed resource estimates in hours to complete the baseline inspection program for all inspectable areas. The table shows

[1] The staff review used resource estimates instead of actual inspection hours because the estimates were based on documented inspection requirements. Actual resource expenditures can vary based on plant conditions and licensee performance.

[2] Assumes nominal samples for a two-unit site.

that for the current baseline inspection program, there were substantial increases in security and other procedure resource requirements, while reactor safety baseline inspection resource requirements decreased from year one of the ROP.

	SECY-99-007 (Pilot Estimates)[4]	SECY-01-0114 (Year 1 ROP)[5]	2019 Resource Estimate[3]	ROP Enhancements
71111 (Reactor Safety) Procedures	1516	1547	1286	1131
71114 (EP) Procedures	59	72	88	72
71124 (Radiation Protection) Procedures	163	172	142	126
71130 (Security) Procedures	104	96	278[6]	239
Other Procedures (71151, 52, 53)	0	278	505	280[7,8]
Plant Status	0	700	699	720[7]
Total Hours	1842	2865	2998	2568

The resource increase from the 1999 estimate to year one of the ROP is attributed to conducting PI&R inspections, PI verification, and event follow-up, which were not included in the pilot estimates.

Proposed Options

After evaluating operating experience, risk insights, and inspector feedback, the staff considered three options, each of which would require Commission approval:

1a. Revise inspection procedures to modify sample sizes and resource estimates for the reactor safety inspections; eliminate IP 71124.02, "Occupational ALARA [As Low as Reasonably Achievable] Planning and Controls," from the radiation protection

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[3] Summation of IMC 2515, Appendix A, "Risk-Informed Baseline Inspection Program," dated March 8, 2013 (ADAMS Accession No. ML13032A168), and IMC 2201, Appendix A, "Security Baseline Inspection Program," dated September 11, 2018 (ADAMS Accession No. ML17306A093) IP Resource Estimates as of 1/1/2019.

[4] SECY-99-007, "Recommendations for Reactor Oversight Process Improvements," dated January 8, 1999 (ADAMS Accession No. ML992740074) Projected Resources.

[5] SECY-01-0114, "Results of the Initial Implementation of the New Reactor Oversight Process," dated June 25, 2001 (ADAMS Accession No. ML011410551) Baseline Inspection Resource Estimate.

[6] Increases can be attributed to extra security inspections resulting from the terrorist attacks on September 11, 2001.

[7] Hours charged to daily CAP review moved to Plant Status. Re-evaluated hours for Plant Status and estimated three hours/day to complete daily CAP review, control room and plant tours. This re-evaluation results in a slight increase in the overall hours to 720.

[8] Reduction in hours additionally includes 47 hours per year by changing the periodicity of the PI&R team inspection from biennially to triennially as described in Option 1.b.

inspection program; no change to the frequency of the biennial PI&R inspection prior to the comprehensive review of the PI&R inspection program.

1b. Revise inspection procedures to modify sample sizes and resource estimates for the reactor safety inspections, eliminate IP 71124.02 from the radiation protection inspection program; and revise the frequency of the biennial PI&R inspection to triennial prior to the comprehensive review of the PI&R inspection program.

2. Evaluate reductions in minimum inspection sample requirements for sustained good licensee performance.

Additionally, in developing proposals for the Commission's consideration, the staff considered maintaining the status quo as an option but rejected that option because it does not address the objective to make the inspection program more risk-informed and performance-based by revising several IPs using risk insights, and developing recommendations based on historical licensee performance in specific inspection areas.

Both Options 1a and 1b would revise inspection procedures to modify sample sizes and resource estimates for the reactor safety inspections. Under MD 8.13, the proposed, individual changes to inspection procedures generally require Commission notification and not approval. Here, however, the staff is seeking Commission approval because these changes, when considered together, would be significant. Specifically, the staff proposes the following revisions to the reactor safety baseline inspections:

- 71111.01, "Adverse Weather Protection"—reduce by one sample and 12 hours
- 71111.04, "Equipment Alignment"—reduce by three samples and 24 hours
- 71111.05, "Fire Protection"—increase by one sample and 5 hours
- 71111.06, "Flood Protection Measures"—reduce by one sample and 8 hours
- 71111.13, "Maintenance Risk Assessment and Emergent Work Control"—revise the sample range based on the number of operating units at a site, with a nominal reduction of two samples and 5 hours
- 71111.18, "Plant Modifications"—reduce by two samples and 21 hours
- 71111.19, "Post Maintenance Testing"—reduce by 24 samples and 84 hours
- 71111.22, "Surveillance Testing"—increase by 12 samples and 42 hours

The large reduction in hours for IP 71111.19 and the related increase in hours for IP 71111.22 are based on consolidating the two inspection procedures into one single procedure to improve efficiency.

Enclosure 2 discusses the bases for the proposed changes to each inspection procedure. The staff has concluded that the sample and resource estimates for each IP will continue to verify that the ROP cornerstone objectives are met.

The staff determined that the existing summer readiness sample under IP 71111.01, "Adverse Weather Protection," is no longer warranted. This required sample was incorporated into the baseline inspection program based on Commission direction in staff requirements memorandum (SRM) M050426, "Staff Requirements - Briefing on Grid Stability and Offsite Power Issues, 9:30 A.M., Tuesday, April 26, 2005," dated May 19, 2005 (ADAMS Accession No. ML051390156). In addition to reviewing this through plant status walkdowns, other Federal entities with regulatory

jurisdiction over the national electric grid have increased oversight and coordination with utilities since implementation of the required sample in 2007. Additional NRC inspection in this area is no longer needed. Further, actions taken in response to open phase circuits and FLEX have mitigated the risk in this area.

The overall proposed resource reductions primarily impact resident inspectors. While there would be fewer baseline inspection requirements, resident inspectors will still be required to follow up on emergent safety issues, maintain cognizance of plant status, and be available for event response. Regional management may have to re-evaluate utilization of resident and region-based inspectors to ensure completion of all baseline inspection requirements.

The pros and cons of the proposed options, stakeholder input on the proposed changes, and the staff's analysis in support of its recommended option (Option 1b) are below:

Option 1a: Implement modifications to sample sizes and resource estimates for the reactor safety inspections; eliminate IP 71124.02 from the radiation protection inspection program; make no change to the frequency of the biennial PI&R inspection prior to the comprehensive review.

Pros:

- The recommended changes are aligned with improving NRC performance as it pertains to the Principles of Good Regulation of efficiency and reliability, and are consistent with Commission policy in SRM-SECY-98-144, "White Paper on Risk-Informed and Performance-Based Regulation," dated March 1, 1999 (ADAMS Accession No. ML003753601), which states a performance-based regulatory approach is one that establishes performance and results as the primary basis for regulatory decision-making.
- This option maintains a sufficient level of oversight to provide assurance that the ROP cornerstone objectives are being met. With improved reactor performance and an increased baseline inspection footprint over 19 years, this option improves efficiency while still helping to ensure reasonable assurance of adequate protection of the public health and safety.
- This option would reduce inspections of licensees in the ALARA area, where the industry has demonstrated longstanding and sustained performance improvement.
- This option would allow for a more comprehensive review of the PI&R inspection program prior to making a frequency change to the team inspection.
- This option would help ensure biennial team inspectors conduct a more timely review of licensee implementation of NEI 16-07, "Improving the Effectiveness of Issue Resolution to Enhance Safety and Efficiency," dated March 2018 (ADAMS Accession No. ML19085A026), referred to as the corrective action program (CAP) 2.0 initiative, if other samples of the 71152 PI&R inspection or Plant Status did not address the issues.

Cons:

- Reducing inspection effort may indirectly result in declining licensee performance in areas receiving less NRC oversight.
- Proposed changes to the baseline inspections could be construed as a relaxation of regulatory oversight because they would reduce the minimum sample size requirements for some inspections.
- This option would not realize any significant efficiencies in the current PI&R inspection

program until after a comprehensive review focused on effectiveness has been conducted and acted upon.

Option 1b: Implement modifications to sample sizes and resource estimates for the reactor safety inspections; eliminate IP 71124.02 from the radiation protection inspection program; revise the frequency of the biennial PI&R inspection to triennial prior to the comprehensive review.

In this option, the staff would revise the frequency of the biennial PI&R inspection to triennial. This change would be made in advance of the comprehensive review of the PI&R inspection program discussed above.

Pros:

- Pros described in Option 1a apply (except with regard to the CAP 2.0 initiative).
- Takes advantage of improvements in and maturity of licensee CAPs that don't change dramatically in a two-year period.
- The option is aligned with the efficiency Principle of Good Regulation because it reduces the frequency of the inspection and still allows inspectors to make a timely assessment of the licensee's implementation of the CAP. There are the many "touchpoints" for inspectors to evaluate the health of the licensee's CAP. For example, daily, semi-annual, and annual reviews would continue; inspectors would continue to ensure that licensees are entering issues into the CAP and that those issues are being corrected.
- The biennial PI&R inspection requires inspectors to review corrective actions related to GTG findings that were not completed by the end of the associated supplemental inspection and were not otherwise reviewed. There are times when all corrective actions for these issues have not been completed when the biennial PI&R is conducted, and therefore must be tracked through other means to follow-up on a subsequent PI&R inspection. Going to a triennial frequency would give licensees more time to implement corrective actions without NRC having to track them for future review.

Cons:

- Cons described in Option 1a apply.
- Declining trends in licensee CAP performance may exist for a greater period before being identified if the touchpoints described above do not identify it prior to the team inspection, due to the change in inspection frequency.
- Changing the biennial PI&R inspection frequency will require the review of three years of CAP information with the same level of resources, when the anticipated effects of CAP 2.0 (i.e., fewer issues tracked in the CAP) have not yet been fully evaluated.
- Evaluations of the safety conscious work environment (SCWE) and licensee self-assessments would be less frequent. If Option 1b is approved, the staff will develop guidance to sample these elements under the annual PI&R sample reviews, which would require some staff time and effort in order to implement for the next triennial inspection cycle beginning calendar year (CY) 2020.
- Changing the PI&R frequency prior to the comprehensive review of the PI&R program may require a subsequent change if the comprehensive review determines the biennial frequency is appropriate.

Option 2: Evaluate reductions in minimum inspection sample requirements for sustained good licensee performance.

Under this option, the staff could pursue, after further evaluation, further reductions in minimum inspection sample sizes or some inspection frequencies for plants that have demonstrated substantial margin to Column 2 performance for a sustained period.

Pros:

- This option is consistent with a performance-based graded approach to oversight where performance is a factor in determining inspection effort. As declining performance results in additional inspection, sustained good performance might result in less inspection.
- This option could provide an incentive for licensees to achieve and maintain performance in Column 1 (Licensee Response column) of the Action Matrix.

Cons:

- This option would require additional analysis and alignment with internal and external stakeholders.
- This option could complicate interpretation/communication of licensee performance because there could be different levels of performance within a single column of the Action Matrix (i.e., Licensee Response), effectively splitting Column 1 into two columns: sustained good performance, and plants that have not sustained good performance—which is contrary to the clarity principle.
- This option could increase the perceived significance of a White inspection finding or PI for licensees who are otherwise "sustained good performers," i.e., those who are receiving reduced minimum inspection samples while in Column 1. Additionally, there would be a larger net inspection resource increase once the plant transitions to Column 2 after the White input is identified.
- This option decreases predictability of licensee performance assessment.

Staff Views Regarding Inspection Program Changes

Comments were solicited at every public meeting; there were none provided by members of the public on changes to the inspection program.

Several staff members, including a majority of the regional administrators and RAP members, have expressed the view that the frequency of the biennial PI&R inspection should not be revised until the comprehensive review has been completed. In their view, a comprehensive review is warranted before implementing a significant change in this area given that an adequate CAP is a fundamental premise of the ROP and allows inspectors to not cite low level violations provided they are entered into the CAP. These staff members believe a change now is premature, noting that a procedure change for implementation in CY 2020 would introduce a frequency change while the recommendations from a comprehensive review could conclude a frequency change is not appropriate. If the staff concluded after the comprehensive review that the appropriate frequency should remain biennial, further reductions in other baseline inspection areas might be necessary to prevent resource creep. These staff members were also concerned that the comprehensive review team could be unintentionally influenced by this change given its timing in relation to the initiation of the comprehensive review effort. There are

also concerns that the biennial inspection looks at areas that are not inspected in other ways, such as corrective actions for past violations and SCWE focus group discussions. Some stakeholders also believe that the end-of-cycle reviews are not an adequate substitute for the PI&R inspections, since the biennial PI&R provides valuable direct inspection input that is used to help form the basis of the assessments made during the end-of-cycle reviews. Lastly, a comprehensive review should be completed to ensure that any inspection program changes will continue to meet the inspection procedure objective to ensure a sampling of all cornerstone areas, and should also consider the lessons learned from the Davis-Besse reactor vessel head event where a longer PI&R inspection frequency and failure to assess on-going problems were key contributors to allowing this condition to remain undetected and were fundamental to development of the current PI&R procedure.

Some staff members expressed the view that the two-year frequency for the PI&R biennial inspection was too frequent, resulting in overlap of areas reviewed during previous inspections. They noted that a three-year frequency would be more appropriate. These staff members have expressed that continued performance of this inspection at the biennial frequency or scope may not be an efficient use of NRC resources. A contrary staff view is that the recent industry implementation of CAP 2.0 means that licensee CAPs are no longer mature programs. However, some program office staff note that CAP 2.0 should not impact a licensee's ability to identify, prioritize, evaluate, and correct nuclear safety concerns. CAP 2.0 allows licensees to focus CAPs on more risk-significant issues.

With respect to Option 2, some staff members have expressed concern with establishing a reduced baseline for good performers. Their stated concern is that NRC established minimum sample sizes for baseline inspections and these minimum samples are appropriate to conclude the ROP cornerstone objectives are being met. Allowing a site to go below this minimum is, in effect, establishing a new minimum sample size which has not been evaluated to conclude the ROP cornerstone objectives would be met. The staff believes that it may be appropriate to consider a reduced baseline inspection program in cases of sustained good performance on the part of a licensee, but only after an evaluation is performed to support such a change. That evaluation has not been completed.

A few regional staff members also noted that an evaluation of changes pending and changes under consideration was not performed in a manner to check that assumptions made in one area are not being negated by a change in another area. Review of such dependencies should be factored into changes being proposed, such as:

- Initiatives to eliminate some required event reports. This may necessitate increased inspection of an event to follow-up on causal evaluations and corrective actions that may have previously been but may no longer be reported.
- Risk-informed decision-making impacts on inspection focus. The original ROP enhancement recommendation included a reduction in outage inspection hours. However, the hours for outage inspections remain unchanged based on a parallel initiative in which regions have better risk-informed the existing number of samples (and corresponding hours) during the inspection. A similar risk-informed analysis of other procedures, which could also result in sample adjustments (i.e., which activities to inspect within an area) with no change to the number of samples or inspection hours, has not been completed.
- Implementation of changes related to Title 10 of *Code of Regulations* (10 CFR) 50.69,

"Risk-Informed Categorization and Treatment of Structures, Systems, and Components for Nuclear Power Reactors."

- The recommended inspection program changes have also not been evaluated to assess how to best position the inspection program to meet potential future challenges associated with reduced licensee resources, aging plants, and challenges posed by emerging problems such as new material degradation mechanisms.

Staff Recommendation for Inspection Program

Taking into account the diverse staff member views discussed above, the staff recommends that the Commission approve Option 1b. Risk insights and inspector experience support the proposed revisions to the baseline IPs. The staff believes these revisions will better risk-inform and improve efficiency and effectiveness of the program while still providing assurance that the cornerstone objectives are being met. Effectiveness will be improved by fewer resources being expended on lower risk areas, such as ALARA, so that inspectors can spend more time on issues of greater safety significance. Better risk-informing the inspections and eliminating redundancies will also improve effectiveness because inspectors again will be focused on issues of greater safety significance. The staff has concluded that there are a sufficient number of touchpoints throughout the annual inspection cycle that assess the health of the licensee's CAP performance to justify changing to a triennial frequency now to reduce redundancies and improve efficiency for evaluating CAPs. The staff will more fully evaluate overall improvements to the PI&R inspection team inspection approach in the future. This option is fully aligned with improving the efficiency Principle of Good Regulation.

Staff Analysis Supporting the Recommended Option (Option 1b)

PI&R Inspections

Several internal and external stakeholders suggested changes to IP 71152, the PI&R inspection, including elimination of the biennial team inspection portion of that IP as a baseline inspection. A fundamental input assumption of the ROP is that each licensee has a mature CAP that is effective in identifying and correcting problems. The biennial PI&R inspection is meant to verify the adequacy of the licensee's ability to identify, evaluate, and correct problems. This inspection is also used to evaluate the licensee's SCWE and Employee Concerns Program.

Feedback from some internal and external stakeholders has indicated that the biennial team inspection may not be fully effective in assessing effectiveness of licensee CAPs, and elements of this inspection activity are redundant to other NRC inspection efforts. In its current state, the PI&R inspection guidance does not include criteria for assessing CAP effectiveness. In 18 years, no biennial PI&R inspection has concluded that a licensee's CAP was ineffective; however, programs have been deemed ineffective during subsequent IP 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs or One Red Input," dated December 18, 2015 (ADAMS Accession No. ML15188A400), inspections of significant issues.

To address the concerns that the aggregate effect of the proposed changes has not been consider holistically, the staff plans to initiate a comprehensive review of PI&R inspections in 2019, seeking to improve the effectiveness of this inspection, with insights from inspections of licensee implementation of NEI 16-07, referred to as CAP 2.0. The staff also plans to evaluate how PI&R inspection changes and evaluations of cross-cutting issues can be enhanced to allow

for better NRC insight into plants with possible indications of declining performance. The staff expects to complete this effort in CY 2020.

The staff review concluded that adjustments could be made to PI&R inspections, specifically the biennial team inspection, to improve efficiency while still making timely assessments of licensee CAP performance. The staff recommendation proposes taking the following two actions that will immediately adjust PI&R inspection activities, while maintaining adequate oversight of PI&R program elements that are unique to the biennial inspection effort:

1) Revise the frequency of the PI&R team inspection from biennial to triennial. Although this change will reduce the amount of oversight of some elements of licensee CAPs, it will not impact the ability of the NRC to assess the adequacy of licensee PI&R programs, since inspectors still have other opportunities to evaluate those elements of licensee CAPs. For example, resident inspectors conduct a daily screening of all issues entered into the CAP, which provides insights into the threshold the licensee sets for identifying issues. Inspectors also perform semi-annual trend analyses, and annual follow-up of selected issues to verify licensees appropriately prioritize, evaluate, and correct conditions adverse to quality. Other baseline IPs include a review of the licensee's CAP for issues in that inspectable area. In addition, regional staff perform a two-year review of all inspection findings for each licensee during end-of-cycle assessment meetings to determine if there are any adverse programmatic trends, including the licensee CAP. The staff performs a semi-annual review of all inspection findings with cross-cutting aspects related to PI&R as part of the assessment of licensee performance in the cross-cutting areas. The regions have the option to perform additional PI&R inspections for licensees in Column 3 or 4 of the Action Matrix when deemed appropriate.

   The staff reviewed PI&R data since CY 2010 and found the number of inspection findings identified during biennial PI&R inspections was steady, and there was a decreasing trend in the number of findings with PI&R cross-cutting aspects, similar to the decreasing trend in overall inspection findings. The number of findings with PI&R cross-cutting aspects decreased by 70 percent while the number of all findings decreased by 53 percent. As a proportion of all findings with cross-cutting aspects, findings with PI&R-cross-cutting aspects decreased from 33 percent to 20 percent since CY 2010. The staff did not identify any adverse trends in industry performance implementing CAPs.

2) Expand the scope of inspectable areas that can be examined by resident and regional inspectors during annual PI&R sample inspections to include subject areas that are unique to the biennial inspection. This change will ensure inspectors have the tools and guidance necessary to assess program areas such as licensee SCWE programs that are currently evaluated as part of the biennial inspection effort.

According to IMC 0308, Attachment 2, "Technical Basis for Inspection Program," dated January 5, 2018 (ADAMS Accession No. ML17114A050), the PI&R team inspection frequency was changed in December 2001 from annual to biennial based on experience and lessons learned during initial implementation. At that time, the staff determined that an annual team inspection for PI&R was not necessary to gain insights into licensee performance due to the other methods available in the inspection program to assess PI&R more frequently. In addition, the staff determined that significant PI&R program degradations occurring from one year to the next is unlikely. Some staff members have expressed that this justification still applies to the biennial frequency for the team inspection. During a two-year interval, inspectors may be

reviewing some of the same issues reviewed during the previous inspection. Inspectors are now required to review implementation of licensee corrective actions for all safety-significant inspection findings. Often all corrective actions may not have been implemented prior to the PI&R team inspection, requiring a means to track corrective actions through a separate process to ensure they are reviewed during a subsequent team inspection. On balance, therefore, the staff is of the view that a triennial frequency allows more time for licensees to implement those corrective actions, eliminating the need to track them for later review. Although the biennial PI&R inspection provides a different (i.e., programmatic) review of licensees' CAPs and is the most appropriate tool for such a review, the redundancies provided by other inspection and assessment opportunities, as noted above, provide a sufficient evaluation of the health of the CAP and provide a basis for revising the frequency now. There are 125 direct inspection hours planned annually for the biennial PI&R inspection. Changing the frequency to triennial will reduce the direct inspection to 83 hours annually.

Radiation Protection Inspections

The NRC established a separate radiation protection (RP) working group to review recommendations requesting (1) that the staff review the radiation safety inspection program to streamline it and to consider applying licensee self-assessments to the oversight of its RP programs, and (2) that the staff consider crediting licensee performance in other cornerstones when evaluating radiation safety inspection findings through the SDP. The staff is still evaluating the feasibility of crediting licensee self-assessments in place of some inspections. The staff rejected the recommendation to credit licensee performance in other cornerstones because it concluded that performance in the reactor safety cornerstones of the ROP is not indicative of performance in the radiation safety cornerstones, nor does good performance in the reactor safety cornerstones mitigate performance issues in the radiation safety cornerstones. The staff communicated this position to external stakeholders at a public meeting on February 28, 2019.

The staff's review of the RP inspections concluded that it could eliminate IP 71124.02 by transferring necessary requirements to other RP procedures, such as (1) in-plant observations to verify licensees are adequately enforcing ALARA plans and techniques pertaining to worker performance, (2) verification of adequate ALARA planning and controls for work packages for significant radiological work, and (3) assessment of licensee evaluations of inconsistent or incongruent results from a licensee's intended radiological outcomes. These recommendations and planned actions are aligned with the efficiency and reliability Principles of Good Regulation. Because of these changes, the staff estimates that approximately 13 hours of the 46 hours budgeted biennially would be moved to other IPs to accommodate ALARA-related inspection activities, resulting in a biennial savings of 33 hours, or 16 hours annually. Further information on the RP inspection program is provided in Enclosure 6.

Staff Analysis of Option 2

The staff evaluated an NEI recommendation to reduce the level of baseline inspection for licensees that have demonstrated sustained good performance by reducing the number of samples and direct inspection hours in the existing inspections. The current program provides a range of sample sizes for most IPs, specifying a minimum and maximum number of samples, and inspectors normally target the nominal sample size when an IP has such a range. The staff's evaluation and proposed sample size reductions to some baseline IPs partially address this recommendation. Establishing a minimum required inspection program ensures that every plant receives the baseline inspection, which is the minimum inspection necessary to determine

if the cornerstone objectives are being met. Reducing minimum required sample sizes increases inspector flexibility to inspect emergent issues that may have greater safety significance.

It may be possible to develop criteria for reducing baseline inspection minimum sample sizes for some inspections based on licensee sustained good performance. For example, IP 71111.05 requires a minimum annual sample size of 16 fire areas to be inspected, or four per quarter, on average. Under this reduced sample size approach and if appropriate from a risk perspective, inspectors might still be able to conclude that the licensee's implementation of their fire protection plan is adequate by inspecting 12 fires areas, or three per quarter, if the licensee's last triennial fire protection inspection did not identify any performance deficiencies related to fire protection. However, the staff has not yet completed an analysis to determine the viability of such a proposal for the entire baseline inspection program. If the Commission approves this option, the staff would evaluate each inspection procedure to determine if additional efficiencies could be realized. If this effort is initiated at the beginning of CY 2020, the staff would target the end of CY 2020 to develop a Commission paper with recommendations.

3. Emergency Preparedness Area

Background

A nuclear power reactor licensee is required by 10 CFR 50.47(b) to meet the 16 PSs established in 10 CFR 50.47(b)(1) through (b)(16). During the development of the EP cornerstone of the ROP, a group of EP subject matter experts, including NRC staff and industry stakeholders, with input from the public, developed the EP SDP documented in Inspection Manual Chapter 0609, "Significance Determination Process," Appendix B, "Emergency Preparedness Significance Determination Process." During the development, the group determined that the planning standard language would not be sufficiently clear for use as a basis for significance determination and instead developed a series of planning standard "functions." These planning standard functions are paraphrases of the planning standards in terms of the significant functions that need to be accomplished, or the capabilities that need to be in place, to maintain the effectiveness of the emergency plan and the emergency response capability. Four "risk-significant" planning standards (RSPS) of 10 CFR 50.47(b)(1) through (b)(16) were identified as being distinct from the other 12 PSs (here-in after known as "non-RSPS"). These RSPS contain the most essential functions of EP to ensure adequate measures are taken to minimize the risk to the public should a radiological emergency occur at the facility. These four RSPS[9] are:

- § 50.47(b)(4) – timely and accurate classification of emergency events
- § 50.47(b)(5) – timely and accurate notification of responsible offsite response organizations (OROs) of an emergency classification and the alert and notification of the public on instructions to take protective actions
- § 50.47(b)(9) – dose assessments of radioactive releases and monitoring of offsite consequences
- § 50.47(b)(10) – in part, development and transmittal of protective action recommendations to responsible OROs

[9] RSPSs are a subset of the PSs. References to "planning standard" or "PS" include the RSPSs, but references to "RSPS" do not include all PSs.

Currently, performance deficiencies for these four RSPS could have White, Yellow, and Red significance. For a Red significance to be assessed, an RSPS would not have been implemented during an actual event in which there were actual consequences on public health and safety. This is not to say that findings related to the non-RSPS functions may not warrant enforcement action, but they do not have the same degree of impact on public health and safety as RSPS findings. Additionally, the non-RSPS significance determinations are compliance-based rather than on their function impacting public health and safety, so they cannot have greater than White significance.

Proposed Options

In response to input from external stakeholders and to identify enhancement opportunities to the current SDP, including those of a transformative nature, the staff performed a focused self-assessment (FSA) that included a review of the EP SDP procedural guidance and recommendations, as well as comments and suggestions collected from internal and external stakeholders on the adequacy of the current process.

The staff's FSA concluded that the EP SDP guidance was adequate in evaluating the significance of findings, and a review of the EP findings from the last few years does not indicate that the EP SDP process is inadequate. However, the staff identified enhancement opportunities. Details on the staff's actions to implement enhancements that do not require prior Commission approval or notification are provided in Enclosure 5.

To further enhance the EP SDP process, the staff is proposing the following options for Commission consideration:

Option 1: Maintain the current risk-informed EP SDP.

In this option the staff would continue to assess significance of inspection findings in the EP cornerstone using the concept of RSPS and their impact on public health and safety, and the significance of a PS to comply with regulations for a degraded or lost PS function.

Pros:

- The current EP SDP is well understood and would require no additional resource effort or training.
- The guidance for assessing significance of EP performance deficiencies is adequate.
- An assessment of EP GTG findings from 2014 to 2018 has indicated a downward trend, (from four findings in 2014, to zero findings in 2018), suggesting that the impact of the proposed revision may be limited.

Cons:

- This option does not align with the objective of enhancing the EP ROP cornerstone.
- The opportunity to provide an enhanced risk-informed approach to assessing risk significance would not be implemented.
- The methodology for assessing risk would be different for the four RSPS and non-RSPS. The significance determination for the four RSPS is based upon the performance deficiency's impact on public health and safety, while the significance of non-RSPS findings would be based upon the extent of compliance with regulations.

Option 2: Revise the EP SDP risk-informed methodology used to assess significance for non-RSPS functions from compliance with regulations to their impact on the ability to implement an RSPS function. Using an enhanced risk-informed approach, only inspection findings for PS functions which may have the potential to directly impact public health and safety may be assessed as GTG.

Pros:

- This option would better risk inform the EP SDP.
- This proposed EP SDP change would improve the efficiency and effectiveness of the EP SDP, with inspectors spending less time determining significance of inspection findings that do not have a direct impact on public health and safety. It would also help focus licensee and NRC resources on the most risk-significant issues.

Cons:

- The change could result in a misperception that non-RSPS functions are not important elements of the emergency plan. This issue, could, however, be adequately addressed through messaging to licensees and the public.
- Revising the methodology could result in a more complex SDP because of additional decision points.

Stakeholder Views Regarding Emergency Preparedness Changes

NEI submitted a letter on December 12, 2017 (ADAMS Accession No. ML17354A094), recommending a revision to IMC 0609, Appendix B, Attachment 2, "Failure to Comply Significance Logic," and related instructions to limit the significance to White, as opposed to Yellow, for findings associated with the loss of a RSPS function. Under NEI's proposal, the NRC would limit to Green the significance of all other Failure to Comply, Degraded RSPS Function, and Loss of a Non-RSPS Function inspection findings and violations.

The industry's concern, as discussed in NEI's letter, is that the EP SDP can generate GTG outcomes for performance deficiencies that appear to be less risk-significant than those that result in GTG outcomes in other SDPs. This could imply that EP functions are of greater relative importance to the protection of public health and safety than the plant systems and procedures that assure safe operation and prevent the need to implement the emergency plan. The perception is that this creates an unbalanced risk assessment that can produce unwarranted GTG findings.

The staff responded to NEI in a letter dated February 7, 2018 (ADAMS Accession No. ML18024A427), in which the agency agreed to "take a fresh look at the EP SDP" and to "convene an expert team to evaluate the EP SDP based on the NRC's experience with the EP SDP as well as inputs from external stakeholders." As part of the staff's "fresh look" at the EP, the staff performed the FSA discussed above. During this evaluation, the staff held a public meeting on June 25, 2018, to present and discuss the scope of its review, and on January 10, 2019, to discuss the draft final report. The report, dated February 1, 2019, can be accessed in ADAMS at Accession No. ML18331A374.

Additionally, in response to NEI's concern that the current EP SDP creates an unbalanced risk assessment that can produce unwarranted GTG findings, the staff compared the total number of inspection findings from the inception of the ROP for the EP cornerstone with the total number of findings for all cornerstones. EP findings accounted for approximately 3 percent of all findings, 20 percent of White findings, and 7 percent of Yellow findings. There have been no Red EP cornerstone findings since ROP inception. The number of GTG EP findings has trended downward from 2014 to 2018.

Staff Recommendation for Emergency Preparedness Area

The staff recommends Option 2. This option would apply a consistent risk-informed methodology to all PS functions in the EP SDP based upon public health and safety and improve the efficacy of the overall EP ROP. The staff believes Option 2 is better aligned with the efficiency Principle of Good Regulation.

Staff Analysis in Support of Recommended Option

Recommendation 1.B in the FSA is the basis for the staff's recommended Option 2 to revise the EP SDP methodology such that only those PS functions that have an impact on public health and safety have performance deficiencies assessed to GTG safety significance. Currently, the non-RSPSs are assessed significance based on compliance with regulations. Although the staff disagrees with the industry's recommendation to limit RSPS findings to White and non-RSPS findings to Green, the staff has determined that there is a valid justification to revise the methodology on risk-informing the non-RSPS functions. This revised risk-informed methodology would assess significance of non-RSPS functions based upon their impact on the ability to implement an RSPS function. This revision in methodology in risk-informing non-RSPS functions would ensure that GTG findings will only be issued for performance deficiencies related to their impact on public health and safety. The current significance assessed for the four RSPS functions will remain the same.

The staff has determined that the following three non-RSPSs contain functions that impact the ability to implement an RSPS function:

- § 50.47(b)(2) – on shift and augmented emergency response organization staffing
- § 50.47(b)(8) – emergency response facilities and equipment
- § 50.47(b)(14) – drill and exercise program to maintain key skills and identify and correct weaknesses

For example, the ability to complete a timely and accurate notification of a declared emergency classification to the responsible OROs depends on the availability of emergency response personnel to perform this activity, which is a § 50.47(b)(2) function. If sufficient emergency response personnel are not available, then the RSPS § 50.47(b)(5) (timely and accurate notification of responsible OROs) might not be performed; thus, the potential exists for delayed offsite response activities potentially impacting public health and safety. The staff notes that a performance deficiency associated with a licensee's ability to implement any PS function during an actual event that has actual consequences on public health and safety would continue to be assessed as GTG significance.

RECOMMENDATIONS:

The staff recommends that the Commission approve the following changes to the ROP:

Issue 1: Assessment Area. The staff recommends that the Commission approve Option 2 to eliminate the minimum four-quarter requirement for GTG inspection findings and to revise the treatment of PIs that cross a significance threshold. This option would add consistency, clarity, and predictability to the assessment process.

The staff also recommends approving a revision to the Enforcement Policy to change the qualitative description of a White inspection finding from "low-to-moderate" safety significance to "low" safety significance, and to change the description of a Yellow inspection finding from "substantial" to "moderate" safety significance. This conforming change would align the Enforcement Policy language to the applicable change to the ROP.

Issue 2: Inspection Area. The staff recommends that the Commission approve Option 1b to modify the reactor safety and RP baseline IPs as proposed, and to revise the frequency of the biennial PI&R inspection to triennial. These changes will improve the efficiency of the inspection program and ensure appropriate oversight while further risk-informing inspections.

Issue 3: Emergency Preparedness. The staff recommends that the Commission approve Option 2 to modify the EP SDP such that only inspection findings for PS functions which may have the potential to directly impact public health and safety may be assessed as GTG.

NEXT STEPS:

The subject of this paper was the staff's recommended near-term improvements to the ROP, defined as those that could be dispositioned in the first six months. Recommendations requiring additional analysis to disposition under a longer-term effort will continue. These recommendations will be described in a memo from the Director, NRR to the Deputy Executive Director for Reactor and Preparedness Programs, and will be made publicly available when issued. In the next phase, the staff will focus efforts on the PI&R comprehensive review, an effectiveness review of the cross-cutting issues process, further changes to the EP SDP, and proposed changes in RP and independent spent fuel storage installation inspections as discussed in the enclosures.

RESOURCES:

If the Commission approves the staff recommended changes to the baseline inspection program (excluding engineering and security inspections), the staff estimates a resource reduction of approximately 11.4 FTE in fiscal year (FY) 2020 and FY 2021 in direct inspection effort using nominal sample sizes. If the Commission approves Option 1a for the inspection area, the resource reduction would be 9.8 FTE, assuming nominal sample sizes. Of the 11.4 FTE estimated resource reduction, 10.9 FTE is attributed to reduced direct inspection performed by resident inspectors who continue to have three main functions: direct inspection, early response to events, and knowledge of plant status. Resident inspector staffing is currently based on Commission direction in SRM-SECY-99-227, "N+1 Resident Inspector Staffing Policy," dated January 11, 2000 (ADAMS Accession No. ML003682526). Full implementation of the estimated reductions will require regional management to adjust inspection activities by the resident inspector and region-based staff to achieve proper utilization.

Resource reductions related to recommended changes to the engineering inspections and security have been previously addressed in SECY-18-0113 and SECY-17-0100 respectively. There should be no increase in resource requirements for any of the options presented in the paper. Impacts on resources for fiscal year 2022 and beyond will be handled as part of the normal planning, budget, and performance management process.

COORDINATION:

This paper has been coordinated with the Office of the General Counsel, which has no legal objection. This paper has also been reviewed and concurred on by the Office of the Chief Financial Officer.

Margaret M. Doane
Executive Director
for Operations

Enclosures:
1. Assessment Area
2. Inspection Area
3. Significance Determination Process Area
4. Performance Indicator Area
5. Emergency Preparedness Area
6. Radiation Protection Area
7. Security Area
8. Independent Spent Fuel Storage Installation Area
9. Data Analysis of White Action Matrix Inputs

SUBJECT: RECOMMENDATIONS FOR ENHANCING THE REACTOR OVERSIGHT PROCESS DATED JUNE 28, 2019

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ML19070A050
ML19070A039
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ML19070A042
ML19070A044
ML19070A045
ML19070A046
ML19070A047
ML19070A048
ML19070A049

*** concurred via e-mail**

OFFICE	NRR/DIRS/IRAB	QTE *	NRR/DIRS/IRAB	NRR/DIRS/IRIB*	RAP:RI*	RAP:RII*
NAME	RGibbs	JD	GBowman	THipschman	JYerokun	JMunday
DATE	03/22/19	03/18/19	03/31/19	03/29/19	04/23/19	04/24/19
OFFICE	RAP:RIII*	RAP:RIV*	D:NRR/DRA*	D:NSIR/DPR*	D:NSIR/DSO*	D:NMSS/DSFM*
NAME	MShuaibi	AVegal (GMiller for)	MFranovich	MScott	MBailey (SAtack for)	MLayton
DATE	04/22/19	04/24/19	04/14/19	04/17/19	04/15/19	05/08/19
OFFICE	D:NRR/DIRS	RI*	RII*	RIII*	RIV*	D: NMSS
NAME	CMiller	DLew (RLorson for)	CHaney	DRoberts	SMorris	JLubinski
DATE	4/29/19	05/20/19	05/13/19	05/21/19	05/20/19	05/10/19
OFFICE	D:OE*	D: NSIR*	OCFO*	OGC*	D.NRR	EDO
NAME	GWilson	BHolian	JMartin	BClark	HNieh	MDoane (SWest for)
DATE	05/08/19	05/10/19	05/29/19	06/07/19	6/14/19	6/28/19

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