POLICY ISSUE
NOTATION VOTE

October 26, 2010 SECY-10-0140

FOR: The Commissioners

FROM: R. W. Borchardt
Executive Director for Operations

SUBJECT: OPTIONS FOR REVISING THE CONSTRUCTION REACTOR OVERSIGHT PROCESS ASSESSMENT PROGRAM

PURPOSE:

This paper responds to Staff Requirements Memorandum (SRM) M081022, Periodic Briefing on New Reactor Issues, dated December 5, 2008, and requests Commission approval of the staff's recommended option for the assessment of licensee performance during the construction of new reactor facilities pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." This paper also provides the Commission information regarding plans for implementation and updates to thresholds in the construction action matrix (CAM), and plans for the development and embodiment of safety culture within the construction inspection program (CIP). This paper does not address any new commitments.

SUMMARY:

The staff recommends that the Commission approve the development of a construction assessment program that includes a regulatory framework, the use of a construction significance determination process (SDP) to determine the significance of findings identified during the CIP, and the use of a CAM to determine the appropriate U.S. Nuclear Regulatory Commission (NRC) response to degrading licensee performance.

CONTACT: Thomas J. Kozak, NRO/DCIP
(301) 415-6892

The staff does not recommend that construction performance indicators (PIs) be developed for use in assessing licensee construction performance at this time. The staff plans to evaluate construction PIs during the annual Construction Reactor Oversight Process (cROP) self-assessment and will recommend their development and implementation if meaningful construction PIs can be identified.

Should the Commission approve the staff's recommendation, staff plans to pilot the new construction assessment program for 12 months and, provided the results of the pilot are positive, the staff will fully implement the new program.

BACKGROUND:

The staff initially described the CIP in SECY-06-0041, "Proposed Strategy to Support Implementation of the New-Reactor Construction Inspection Program," dated February 22, 2006. The CIP builds on the lessons learned from the construction of the existing fleet of operating reactors. The CIP comprises four different parts and is described in Inspection Manual Chapter (IMC) 2501, "Construction Inspection Program: Early Site Permit (ESP)"; IMC 2502, "Construction Inspection Program: Pre-Combined License (Pre-COL) Phase"; IMC 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)"; and IMC 2504, "Construction Inspection Program—Inspection of Construction and Operational Programs." These IMCs cover all aspects of the inspection program, from early site preparation work, through construction, to the transition to inspections under the Reactor Oversight Process (ROP) for operating reactors.

In SECY-07-0047, "Staff Approach to Verifying the Closure of Inspections, Tests, Analyses, and Acceptance Criteria Through a Sample-Based Inspection Program," dated March 8, 2007, the staff described its planned approach to select those ITAAC to be given priority for inspection and how these inspection results will be used to support ITAAC closeout. The Commission approved this inspection approach in the SRM, Staff Requirements—SECY-07-0047, Staff Approach to Verifying the Closure of Inspections, Tests, Analyses, and Acceptance Criteria Through a Sample-Based Inspection Program," dated May 16, 2007.

In SECY-08-0155, "Update on the Development of the Construction Inspection Program for New Reactor Construction Under 10 CFR Part 52," dated October 17, 2008, the staff described its planned approach to the assessment of licensee construction performance, which is described in IMC 2505, "Periodic Assessment of Construction Inspection Program Results." As part of the finding screening process described in SECY 08-0155, the significance of the identified findings would be used over a predetermined period of time as an input to the assessment of licensee performance. The construction assessment program currently described in IMC 2505 uses traditional enforcement to determine the significance of violations. The staff did not develop construction PIs or a construction SDP as part of the staff proposals in SECY-08-0155.

The staff briefed the Commission on new reactor issues, including the IMC 2505 assessment program, on October 22, 2008. On December 5, 2008, the Commission directed the staff in SRM M081022 to reconsider the construction assessment process as presented in IMC 2505 and to propose policy options to the Commission. The Commission also directed that the staff proposal should address the construction program oversight already inherent in the ITAAC monitoring and closure processes, and the inclusion in the construction oversight process of objective elements such as construction program PIs and SDPs analogous to those used in the

ROP. The Commission further directed the staff to keep the Commission informed of plans for implementation and updates to thresholds in the construction response table, and plans for the development and embodiment of safety culture within the CIP.

In SECY-09-0113, "Update on the Development of Construction Assessment Process Policy Options and the Construction Inspection Program Information Management System," dated August 14, 2009, the staff described a proposal submitted to the NRC in a draft white paper from the Nuclear Energy Institute (NEI) titled, "Proposed Construction Inspection Assessment Process (CIAP)," dated July 3, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML092020274) that presented a concept for the construction assessment process that is similar in structure to the ROP regulatory framework. The staff determined that the NEI proposal had merit but required development work.

On November 16, 2009, the staff conducted a Category 3 public meeting that featured a panel discussion during which views on construction assessment program options were presented in a forum open to the agency's stakeholders and the public. Meeting participants included senior managers from the NRC, NEI, industry representatives, and a representative from the State of Georgia. During that meeting, stakeholders provided feedback that a cROP analogous to the NRC's ROP should be developed and that all aspects of the operating reactor assessment program should be evaluated for inclusion in the cROP.

The staff formed a cROP working group in December 2009 with representatives from each regional office, the Office of Nuclear Reactor Regulation, the Office of Nuclear Security and Incident Response, and the Office of New Reactors (NRO). This working group reached out to stakeholders for input on construction assessment process options through 10 Category 2 public meetings with the NEI-led Construction Reactor Oversight Process Task Force, four Category 3 public meetings, the 2010 Regulatory Information Conference, the 2010 American Nuclear Society Utility Working Conference, and a *Federal Register* notice.

In August 2009, NRO issued an ESP and limited work authorization (LWA) to Southern Nuclear Operating Company for the Vogtle site near Augusta, GA. The LWA allows a narrow set of construction activities at the Vogtle site that are limited to placement of engineered backfill, retaining walls, lean concrete, mudmats, and a waterproof membrane. In SECY-10-0038, "Update Status on the Development of Construction Reactor Oversight Process Options," dated April 2, 2010, the staff informed the Commission that the construction activities authorized by the LWA would warrant the implementation of the NRC's construction assessment program in the near future. On July 1, 2010, the staff implemented the formal construction assessment program described in IMC 2505.

<u>DISCUSSION</u>:

<u>Construction Reactor Oversight Process</u>

Based on public interactions with stakeholders and cROP working group discussions, the working group used the following basic guiding principles to refine the cROP and develop construction assessment program options:

- The objective of construction oversight is to evaluate licensee performance of construction activities and the effectiveness of licensee oversight and quality assurance efforts associated with construction, in order to appropriately focus NRC resources and independently assess if the plant is constructed in accordance with regulatory requirements.

- The cROP should include a regulatory framework consisting of strategic performance areas and associated cornerstones.

- The significance of findings should be determined using a predictable and transparent process, similar to the ROP's SDP.

- The CIP is not limited to independently assessing the completion of ITAAC listed in the combined license. The NRC must also consider inspection and assessment of both construction and operational programs that the licensee is required to develop and implement.

- Transition from construction to operating reactor oversight is expected to occur once the Commission makes a positive determination under 10 CFR 52.103(g) that all ITAAC acceptance criteria are met.

- The cROP must be robust enough to continue to be relevant and viable until the ROP is ready to assume oversight responsibilities after the 10 CFR 52.103(g) finding.

- The cROP structure should be kept as simple as possible. The agency should not attempt to create a process that can handle all possible scenarios, but should only design it to handle routine and expected situations. The cROP should define an appropriate process to ensure that the necessary deviations resulting from unexpected situations are documented, approved, and reviewed in a predictable and transparent manner.

- The use of PIs in conjunction with inspections should be considered in the cROP where relevant and feasible.

- Similar to the ROP, the cROP should identify and define bands of performance requiring increased levels of NRC oversight corresponding to degraded licensee performance. The bands should include a threshold above which licensee performance is deemed unacceptable and should identify the corresponding regulatory actions.

- Similar to the ROP, the cROP should identify a licensee performance band that does not require additional regulatory oversight beyond the baseline inspection level.

- The cROP should evaluate both performance findings and programmatic findings.

- Due to the transitory phases of construction, the cROP cornerstones may not be of equal weight, and a construction assessment process may not integrate them equally.

In September 2010, the staff issued IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document," which provides the basis for the significant decisions made in developing the cROP and serves as the source of information for all applicable program documents, such as manual chapters and assessment guidance. Enclosure 1 provides an overview of the cROP.

In the cROP, the staff implements the CIP. Inspection findings are evaluated for safety significance and enforcement actions are considered, as appropriate. Inspection findings are also considered during the ITAAC closure verification process. The resulting information is then assessed and an appropriate NRC response is determined using the guidelines in the CAM. NRC then uses various communication avenues to inform stakeholders of its regulatory decisions and actions.

Proposed Construction Regulatory Framework

The cROP working group used a top-down, hierarchical approach to develop the concept for a new construction regulatory oversight framework that addresses the agency's regulatory principles. The working group then identified those aspects of licensee performance during the construction life cycle that are important to the mission and, therefore, merit regulatory oversight.

Enclosure 2 describes the proposed construction regulatory framework. Within this framework, the NRC's cROP provides a means to collect information about licensee performance, assess the information for its safety and security significance, and provide for appropriate licensee and NRC responses. There are three key strategic performance areas: construction reactor safety, safeguards programs, and operational readiness. Within each strategic performance area are cornerstones that reflect the essential safety aspects of facility construction. These six cornerstones include design/engineering, procurement/fabrication, construction/installation, inspection/testing, security programs for construction inspection and operations, and operational programs. Satisfactory licensee performance in the cornerstones provides reasonable assurance that the facility has been constructed and will be operated in conformity with the combined license.

The staff envisions that all findings associated with ITAAC-related work activities, including emergency preparedness and security ITAAC, will be assigned to a cornerstone in the strategic performance area for construction reactor safety. Non-ITAAC programmatic findings will be assigned to either the security programs for construction inspection and operations cornerstone or the operational programs cornerstone. Licensee performance within these cornerstones will be used as part of the assessment process to focus NRC resources and provide reasonable assurance that the plant is constructed in accordance with regulatory requirements.

Assessment of Violations/Findings Using Traditional Enforcement

The 10 CFR Part 52 construction assessment program currently in place uses traditional enforcement approaches to evaluate the significance of inspection findings. This is similar to the approach the staff used successfully during the Browns Ferry Unit 1 restart and the approach it is using to assess construction activities at Watts Bar Unit 2, the Louisiana Energy Services (LES) Gas Centrifuge Facility, and the U.S. Department of Energy Mixed Oxide (MOX) Fuel Fabrication Facility. The staff has practical experience implementing this approach and has not observed any widespread problems with its use in the construction assessment environment. However, only one escalated enforcement case has been identified at these facilities to date, so there is limited current experience with evaluating more complex construction deficiencies using traditional enforcement.

The construction assessment process currently described in IMC 2505 defines a finding as a violation of NRC requirements. The NRO staff has worked closely with the Office of Enforcement during the development of a recent revision to the Enforcement Policy that has been approved by the Commission and published in the *Federal Register* on September 30, 2010 (75 FR 60485). In this revision, the staff has included examples of violations in each of the four severity levels as guidance in determining the appropriate severity level for violations identified through the CIP. Using examples as guidance in dispositioning findings provides a level of transparency and predictability to the oversight of licensee performance. As additional experience is gained in the CIP, the Enforcement Policy will be updated if necessary based on the lessons learned to further enhance the predictability associated with traditional enforcement.

It is possible that the NRC will identify findings under the CIP that are associated with the implementation of quality assurance programs. This includes issues that span multiple structures, systems, and components. Traditional enforcement is well suited to disposition findings associated with inadequate program development and implementation and allows the inspection staff and licensee to focus on the programmatic issue at hand.

One of the recommendations in NUREG-1055, “Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants,” issued May 1984, was for the NRC to take stronger enforcement action in the oversight of nuclear power plant construction. The use of traditional enforcement allows for the issuance of notices of violation (NOVs) and the consideration of the use of civil penalties for escalated enforcement cases.

Assessment of Violations/Findings Using a Construction Significance Determination Process

Per the Commission’s direction in SRM M081022, the staff has reconsidered the construction assessment program and determined that a construction SDP can be used to assess the significance of most construction findings identified through the CIP. Analogous to the ROP, findings identified under the CIP involving discrimination against workers for raising safety issues or other willful violations, incidents with actual safety consequences, and actions that may adversely affect the NRC’s ability to monitor utility activities would continue to be processed under traditional enforcement. For example, Section VIII of the design certification rules and 10 CFR 50.59, “Changes, Tests and Experiments,” establish the conditions under which applicants and licensees may make changes to the facility or procedures and conduct tests or experiments without prior NRC approval. Proposed changes, tests, and experiments that satisfy the definitions and one or more of the criteria in the rule must be reviewed and approved by the NRC before implementation. Violations identified under the CIP that are associated with these requirements would be dispositioned using traditional enforcement.

If a construction SDP is used to disposition findings identified under the CIP, the staff envisions implementing a finding screening process that is based on the ROP’s screening process and is described in Enclosure 3. The screening process begins with an issue of concern (IOC), which is a well-defined observation or collection of observations. The first step is to determine if an IOC is a willful violation warranting investigation by the Office of Investigations. Then, the screening process proceeds to determine if the IOC is a performance deficiency (PD). A PD is an issue that is the result of a licensee not meeting a requirement or standard when the cause was reasonably within the licensee's ability to foresee and correct and, therefore, should have been prevented. A PD can exist if a licensee fails to meet a self-imposed standard or a standard required by regulation; thus, a PD may exist independently of whether a regulatory requirement was violated. The use of PD's in a construction environment would provide a process for use in dispositioning non safety-related IOCs.

Once a PD is determined to exist, two paths are taken. The first path is to determine whether the PD affects the regulatory process or is associated with actual consequences and therefore would be addressed through traditional enforcement and not the SDP. The second path is to determine whether the PD is of more than minor significance. If the PD is associated with traditional enforcement, that violation is processed separately from the underlying technical issue. If the PD is more than minor, the IOC is considered a finding and its significance is determined through the construction SDP.

Inspection findings processed through the current ROP SDP, including associated violations, are documented in inspection reports and are assigned a color of green, white, yellow, or red, depending on their safety significance. The SDP uses risk insights, where possible, to assist the NRC staff in determining the safety or security significance of inspection findings identified within the ROP. SDPs that could not be related to core damage or containment failure risk used other rationale for assigning significance. Historically, such other factors included those listed in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 1, issued November 2002, such as maintaining defense in depth, compliance with regulations, engineered safety margins, and expert staff judgment. An SDP similar and analogous to the ROP Security SDP will be utilized in the safeguards strategic performance area.

It took several years and significant resources to develop all of the SDPs for the ROP and the tools needed by the inspection staff to implement them. However, the staff expects that a construction SDP will be simpler and more straightforward than the ROP SDP, so that fewer resources and less time will be necessary to develop and implement the process. Because there is no fuel in the reactor vessel during construction, it is not practical to relate a construction SDP to core damage or containment failure risk. Therefore, the staff used other factors in developing the construction SDP approaches, described in detail in Enclosure 3.

The staff believes that a construction SDP is needed to process programmatic findings and that a separate SDP is needed to process technical findings. The staff developed a flow chart to disposition programmatic findings. The staff considered two viable approaches to the development of a construction technical finding SDP. One approach would be to use a matrix to determine the significance of findings. The second approach would be to use a flow chart to determine the significance of findings. A goal in the development of a construction SDP was to ensure that findings can be processed through the SDP in a timely, transparent, and repeatable manner. Although neither of these approaches has been fully developed, the staff believes that this goal can be met with either of the construction SDP approaches described in Enclosure 3.

The staff designed the proposed cROP structure and construction SDP to handle routine and expected situations. In rare instances, when the construction SDP is not well suited for the specific application, the staff may be required to use qualitative engineering judgment and regulatory oversight experience to determine the significance of findings. The staff plans to develop a process analogous to that used by the ROP for these rare instances.

Using the SDP to determine the significance of findings in the ROP allows NRC actions and conclusions to be more objective, predictable, transparent to all stakeholders, and repeatable for findings of comparable significance. It is reasonable to expect that the same benefits would be realized in the evaluation of construction inspection findings with a construction SDP.

A high-level review of historical issues that resulted in escalated enforcement during the last power reactor construction cycle revealed that many of the issues were programmatic in nature or involved other issues that could be difficult to process using a construction SDP. Although the power reactor construction licensing process under 10 CFR Part 52 is different than that under 10 CFR Part 50, the underlying processes and programs used by licensees to ensure compliance and the NRC's regulatory expectations regarding quality construction are similar. Thus, there is the potential that similar issues may need to be addressed by the NRC in the future. To address this issue, the staff developed a simple flow chart to disposition programmatic issues.

There are potential NRC resource impacts from the use of a construction SDP that are difficult to estimate at this time. For example, each region and the Office of Nuclear Reactor Regulation have senior reactor analysts assigned to participate in the implementation of the ROP. However, the staff does not envision that there will be a need for senior reactor analysts to participate routinely in the CIP.

It is also possible that the use of a process similar to the ROP could delay the processing of some findings; there have been instances in the ROP when complex issues were not processed through the SDP in a timely manner and considerable licensee and NRC resources were expended conducting the risk determination. It is possible that similar issues could arise if a construction SDP is developed and implemented. This could be problematic in a fast-paced construction environment. However, timeliness issues in the ROP have primarily been associated with Phase 3 SDP evaluations (the most detailed and complete evaluations). The staff does not envision the need for Phase 3 evaluations for construction activities and many of the same challenges to the use of an SDP can be expected during the development of the regulatory basis for issuing an escalated enforcement action through the traditional enforcement process.

The staff believes that it would be prudent to pilot the construction SDP to ensure that it can be effectively implemented and provide the benefits that have been realized in the ROP without negatively affecting the staff's ability to process findings identified through the CIP in a timely manner. The staff believes that meaningful results can be only be obtained from a pilot once significant construction work begins. Therefore, the staff would begin the pilot once a combined license is issued and significant construction begins at a construction site.

Performance Indicators

The staff considered the development of construction PIs as a means of measuring licensee performance in areas that are covered by the CIP. In evaluating potential PIs, the staff first reviewed and applied the basis for the initial development of PIs in the ROP. The staff tried to identify PIs for construction program performance that (1) were capable of being objectively measured, (2) allowed for the establishment of a threshold to guide NRC and licensee actions, (3) provided a reasonable sample of performance in the area being measured, (4) represented a valid and verifiable indication of performance in the area being measured, (5) would encourage appropriate licensee and NRC actions, and (6) would provide sufficient time for the NRC and licensees to correct PDs before the deficiencies posed an undue risk to public health and safety.

The NRC developed the ROP with the benefit of four decades of operational experience and, generally speaking, steadily improving plant performance. Before implementing the ROP, industry (Nuclear Management and Resources Council, NEI, Institute of Nuclear Power Operations) and the NRC (Office for Analysis and Evaluation of Operational Data, Office of Nuclear Regulatory Research) maintained plant operational PIs that were used in various ways to assess overall industry and individual plant performance. These PIs were used as a basis to develop the PIs that were implemented as part of the ROP assessment process. The staff initially developed the ROP PI thresholds based on years of historical licensee performance data collected by the NRC and industry. Performance data against which to benchmark new construction PI thresholds does not exist.

The staff plans to evaluate the development and implementation of construction PIs during the annual cROP self-assessment process. As part of this process, the staff will monitor the industry's use of PIs and will also monitor international construction experience to determine if PIs can be developed and used as an input to the assessment of licensee performance. Until experience is gained with the CIP, and data can be gathered upon which to base thresholds, the staff does not recommend the development and implementation of construction PIs. If PIs were incorporated into the cROP in the future, greater-than-green PIs would be an input to the CAM along with greater-than-green inspection findings, analogous to the inputs to the ROP's action matrix.

Safety Culture

The staff recognizes that a strong safety culture during new reactor construction is paramount to ensuring that newly constructed plants are in compliance with the design and will be capable of operating safely following construction. In order to address historical construction issues identified in the United States (e.g., NUREG-1055) and current international experiences that have reemphasized the importance of safety culture in the new construction environment, the staff believes that it is essential to include an assessment of a licensee's safety culture in the construction assessment process. Therefore, the staff developed a near-term approach to safety culture that closely resembles the operating reactor assessment program's safety-culture approach. This approach includes tagging findings with construction cross-cutting component aspects, evaluating these findings against a predefined set of criteria to determine if a significant concern exists, and conducting appropriate follow-up actions using a graded approach. In this approach, significant concerns will be treated in a manner analogous to the ROP's substantive cross-cutting issues. The current construction safety culture approach is described in IMC 2505.

In order to remain aligned with agency safety culture developments, NRO representatives have been involved with NRC staff activities pursuant to the Commission direction provided in COMSECY COMGBJ-08-0001, "A Commission Policy Statement on Safety Culture," dated February 25, 2008. The formulation of a long-term, agency-level approach to safety culture is ongoing. The staff intends to continue to work with industry and other stakeholders and will develop a long-term approach to safety culture that is aligned with the agency-level approach.

Construction Action Matrix

In the assessment program currently described in IMC 2505, the NRC determines its regulatory response to licensee performance in accordance with a CAM that provides for a range of actions commensurate with the significance of the construction inspection results. The CAM is intended to provide consistent, predictable, and understandable agency responses to licensee performance. The CAM currently contains four columns, with actions that are graded such that the NRC becomes more engaged as licensee performance declines. Overall response to licensee performance will be determined by the number of violations that rise to the level of escalated enforcement (Severity Level I, II, or III). For licensee's that have escalated enforcement issues, the NRC will conduct additional inspections beyond the baseline inspection program and initiate other actions commensurate with the safety significance of the issues.

As is the case in the ROP, there may be rare instances in which the regulatory actions dictated by the CAM may not be appropriate. In these instances, the agency may deviate from the CAM to either increase or decrease agency action when approved by the Executive Director for Operations.

If the Commission approves the proposed regulatory framework and construction SDP, the color of findings would become the input to the CAM. The thresholds for crossing CAM columns would be based on the number and significance of findings in the respective cornerstones. However, due to the transitory phases of construction, the cROP cornerstones will not be of equal weight. Therefore, thresholds for crossing columns in the CAM may differ from the ROP's action matrix thresholds. The staff plans to continue to work with stakeholders to update the CAM structure and thresholds pending Commission construction assessment program direction.

Assessing Construction Performance

The current construction assessment program is divided into three basic parts: continuous assessment, quarterly assessment, and semiannual performance reviews. The continuous assessment of construction performance begins with the onset of the CIP. Formal quarterly assessments and semiannual performance reviews begin after a LWA and/or a combined license has been issued, the NRC has implemented either IMC 2503 or 2504, and there is sufficient activity occurring for any assessment to be meaningful.

During the semiannual performance review assessments, violations identified during the previous 6 months or remaining open from previous quarters will be evaluated to determine if a construction substantive cross-cutting issue exists. As mentioned above, the existence of violations resulting in escalated enforcement will be used as the input to determine the appropriate column of the CAM that applies to the licensee's performance. The NRC's response to licensee performance will be determined by the actions listed in the applicable column of the CAM and by the number and duration of construction substantive cross-cutting issues. Semiannual performance review results will be communicated to the licensee and the public via assessment letters. A public meeting with the licensee will be conducted on an annual basis following issuance of every second semiannual performance review assessment letter to discuss the results of the NRC's assessment of the licensee's performance over the prior year.

Enforcement

In the construction assessment program currently in place, the staff is implementing the traditional enforcement process, including the issuance of NOVs and the consideration of the use of civil penalties for escalated enforcement cases. The current assessment process also allows the staff to use enforcement discretion, when appropriate, to issue noncited violations (NCVs) in lieu of NOVs. The use of NCVs as part of the enforcement process is predicated on a licensee having an adequate corrective action program into which identified issues are entered and effectively resolved in a timely manner. Because the corrective action program at construction sites will be new and implemented initially by individuals with limited experience with the new program, and because construction will likely involve program implementation by contractors, the NRC will not consider the use of enforcement discretion through NCVs until there is independent NRC confirmation that the new program is adequate and being effectively implemented.

If the Commission approves the use of a construction SDP to determine the significance of findings, the staff plans to revise the Enforcement Policy, if necessary, to provide cROP enforcement guidance that is similar to the guidance that is provided for ROP enforcement actions. The NRC would first assess a finding to determine if there was discrimination against workers for raising safety issues or other willful violations; actions that may adversely affect the NRC's ability to monitor utility activities; and incidents with actual safety consequences. If the finding met one of these criteria, the NRC would impose traditional enforcement. These types of findings would not be an input to the CAM. All other findings would be evaluated using the construction SDP to determine the level of significance and would be considered in the CAM.

cROP Self-Assessment Process

The staff plans on developing a cROP self-assessment process that will be modeled after the ROP's self-assessment process. On an annual basis, the staff will inform the Commission, NRC senior management, and the public of the results of the cROP self-assessment program, including any conclusions and resultant improvement actions. As mentioned in this paper, the staff will evaluate construction PIs during the annual self-assessment to determine if the development and implementation of PIs would be an effective and efficient means of gathering and assessing licensee performance information.

A review of the cROP self-assessment will be incorporated into the Agency Action Review Meeting (AARM) process. The guidance for the AARM will also be revised to include criteria for when a construction licensee is discussed during the AARM.

Stakeholder Feedback

From December 2009 to August 2010, the staff reached out to stakeholders for input on construction assessment process options during 10 Category 2 public meetings with the NEI-led Construction Reactor Oversight Process Task Force, four Category 3 public meetings, the 2010 Regulatory Information Conference, the 2010 American Nuclear Society Utility Working Conference, and a *Federal Register* notice soliciting feedback on the development of construction assessment program options.

NEI was the only respondent to the *Federal Register* notice. In its response, which is included as Enclosure 4, NEI stated, in part, that it was in substantive agreement on the proposed cROP framework, including cornerstone objectives and attributes; the proposed use of a construction SDP to evaluate the significance of findings identified through the CIP; and the deferral of the development of construction PIs. Interactions with NEI at Category 2 and Category 3 public meetings has also resulted in agreement that the use of the PD concept is appropriate for construction inspection and assessment. However, NEI stated that the industry has concerns about whether the current ROP safety culture approach, which has been adapted for construction, is effective. NEI stated that, in the future, it will present an alternative safety culture approach for new construction.

During the November 16, 2009, panel meeting, the State of Georgia representative recommended that radiation protection and emergency response should be construction cornerstones of safety. The staff considered this position but ultimately determined that, because of the nature of nuclear plant construction, these functional areas do not warrant separate cornerstones and are sufficiently covered as areas to measure in the operational programs cornerstone.

<u>Construction Assessment Program Options and Recommendations</u>

The staff is proposing three options for the Commission in setting policy for the construction assessment program. Each option uses traditional enforcement to disposition violations associated with discrimination against workers for raising safety issues or other willful violations, actions that may adversely affect the NRC's ability to monitor utility activities, including violations of the requirements in 10 CFR 50.59, and incidents with actual safety consequences. In addition, each option employs the use of a CAM to determine the NRC's regulatory response to licensee performance. Further, each option implements the near-term approach to safety culture that is described in IMC 2505. The use of construction PIs is not recommended in any of the options. The options differ primarily in the use of a regulatory framework and in the approach to determining the significance of construction findings.

- Option 1: Continue to implement the construction assessment program as currently described in IMC 2505.

  In this option, the staff would continue to use traditional enforcement to disposition CIP inspection findings and to use the severity of the findings as the input to the CAM. This option would be the most efficient for the staff to implement. The use of traditional enforcement has already been established and was done effectively to address issues identified by inspectors during the Browns Ferry Unit 1 recovery project. Traditional enforcement is also being used successfully for the Watts Bar Unit 2 reactivation and construction projects at the LES and MOX facilities. This option requires no revisions to program guidance documents and is already implemented at Vogtle. In addition, staff training has been completed for this approach. Completion of the CIP using traditional enforcement to evaluate the significance of findings and ensuring that adequate corrective actions were implemented to address the findings would provide reasonable assurance that the facility has been constructed in accordance with regulatory requirements. In addition, the use of traditional enforcement may minimize the potential for delays in enforcement while determining the risk of a finding.

- Option 2: Implement a construction regulatory framework, including strategic performance areas and cornerstones; use traditional enforcement to disposition CIP inspection findings; and use the severity of the findings as the input to the CAM.

  In this option, the staff would implement the regulatory framework that has been developed and is described in Enclosure 2. Implementation of a regulatory framework may bring more structure to the construction assessment program and allow for the better integration of findings to identify adverse trends in licensee performance.

  Traditional enforcement would be used to disposition CIP inspection findings, and the severity level of the findings would be the input to the CAM. However, thresholds in the CAM would be tied to cornerstone performance, and the NRC's response to licensee performance issues should be more transparent and predictable than in Option 1.

  Approval of this option would require the staff to update program guidance documents and provide inspector training.

- Option 3: Develop a construction assessment program that includes a regulatory framework, the use of a construction SDP to determine the significance of findings identified during the CIP, and the use of a CAM to determine the appropriate NRC response to degrading licensee performance. Pilot the new construction assessment program in parallel with the current assessment process for 12 months and, provided the results of the pilot are positive, fully implement the new program.

  In this option, the staff proposes to implement the regulatory framework that has been developed and is described in Enclosure 2 and to finalize the construction SDP using the work described in Enclosure 3 as a basis. The staff also proposes to modify the finding screening process to include the PD concept. The staff proposes to continue to use traditional enforcement for violations that do not fit into the SDP, such as violations involving willfulness, etc.

  The construction SDP would be used to disposition CIP inspection findings, and the significance of the findings would be the input to the CAM. Thresholds in the CAM can be tied to cornerstone performance. Although there is some subjectivity in evaluating findings using an SDP, on balance, given the ROP's SDP experience, use of a construction SDP may allow NRC actions and conclusions to be more objective, predictable, and transparent to all stakeholders, and more repeatable for findings of comparable significance than in Options 1 and 2.

  Approval of this option would require the staff to fully develop a construction SDP, develop draft Enforcement Policy guidance regarding the disposition of findings identified in the CIP, update other program guidance documents, and provide inspector training. Once these actions are complete, the staff would pilot the process in parallel with the existing process for 12 months at construction sites where the formal assessment process described in IMC 2505 has been implemented. The staff would then evaluate the results of the pilot. If the pilot is found to be successful, the staff will then implement this option. If significant adverse information is revealed, the staff will inform the Commission with revised options.

RECOMMENDATION:

The staff recommends approval of Option 3. The staff believes that Option 3 includes elements that provide for the most objective approach to the cROP. This option also provides for stakeholder involvement in the development of the construction SDP. If directed by the Commission to implement Option 3, the staff would carry out the revisions to the cROP per the milestones in Enclosure 5. The staff also would continue to evaluate construction PIs during the annual cROP self-assessment and would recommend their development and implementation if meaningful construction PIs are identified.

RESOURCES:

Option 1 would require no additional resources.

Option 2 would require approximately 0.5 full-time equivalent staff (FTE) in FY 2011 for program guidance document updates and staff training.

Option 3 would require a total of approximately 4 FTE in FYs 2011 and 2012 for SDP development, program guidance document updates, staff training, and pilot implementation.

Implementation of each option can be accomplished within currently budgeted resources.

COORDINATION:

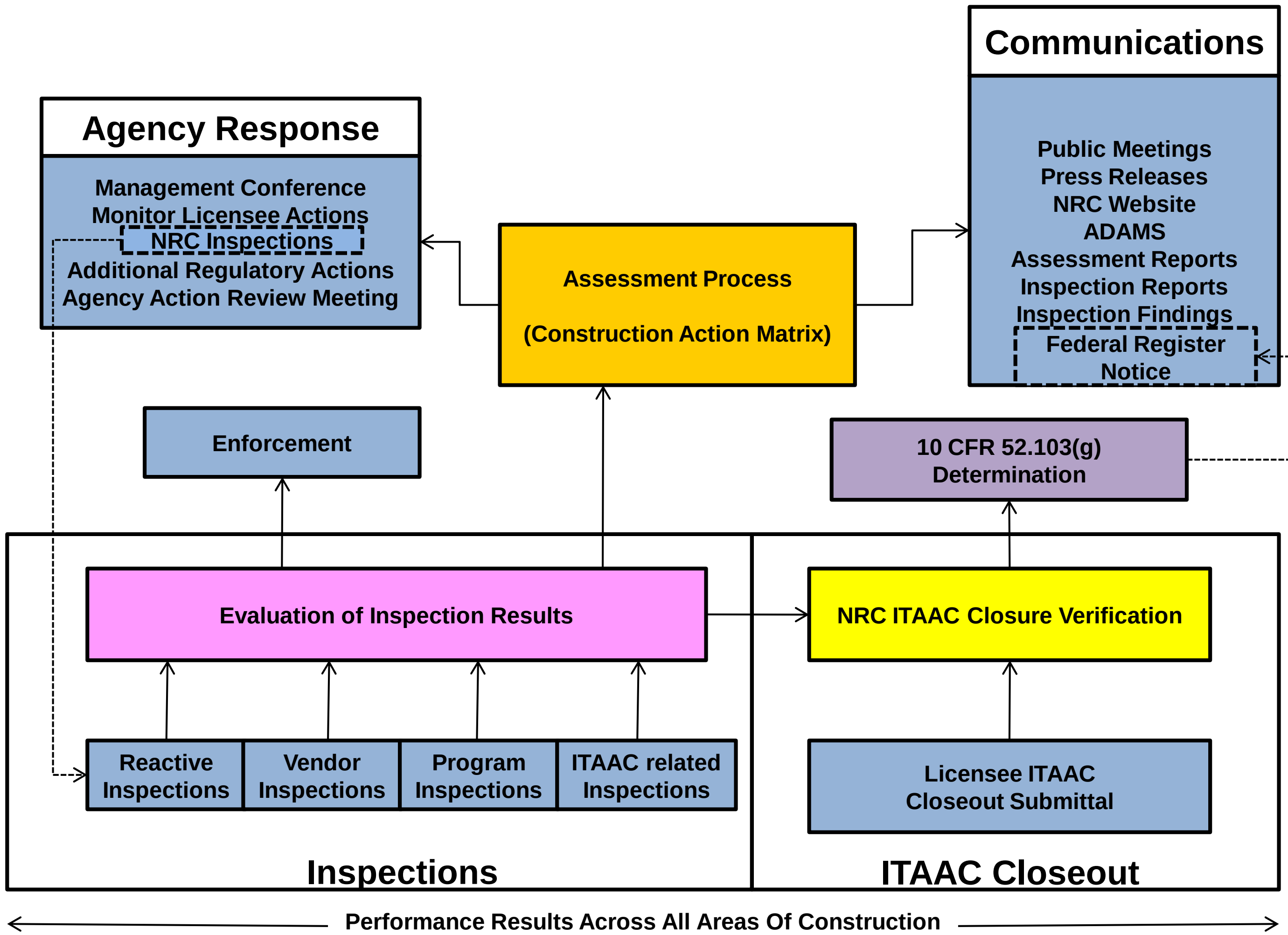
The Office of the General Counsel has reviewed this paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this paper for resource implications and has no objections.

/RA by Martin J. Virgilio for/

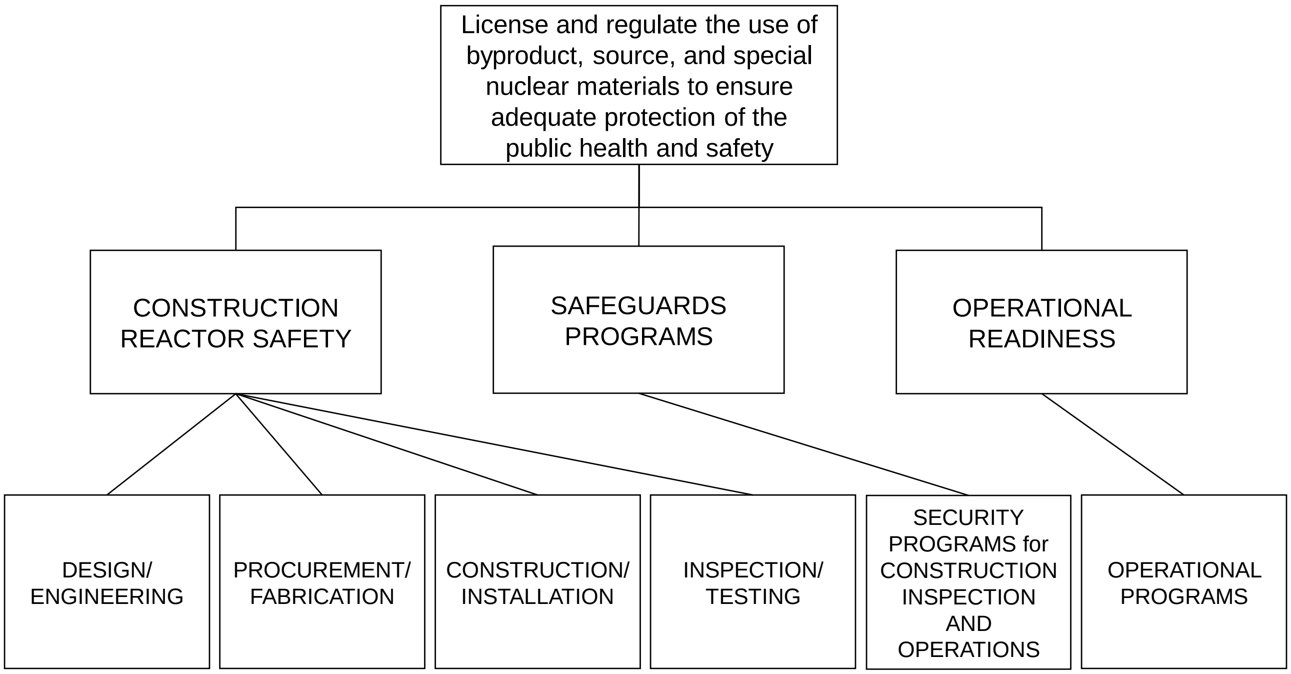
R. W. Borchardt
Executive Director
for Operations

Enclosures:
1. Construction Reactor Oversight Process Overview
2. Construction Reactor Oversight Process Regulatory Framework
3. Construction Significance Determination Process
4. Letter from NEI dated August 6, 2010
5. Milestones for Option 3

Construction Reactor Oversight Process Overview



CONSTRUCTION REACTOR OVERSIGHT
PROCESS REGULATORY FRAMEWORK



Construction Reactor Oversight Process Cornerstone Objectives, Attributes, and Areas to Measure

Cornerstone	**Design/Engineering**
Objective	**To Independently Assess the Licensee's Methods To (1) Develop and Implement Detailed Design and Construction Drawings and Procedures, and (2) Implement a Design Change Process**
Attributes	**Design Control, Procedure/Document Quality**
Areas To Measure	**ITAAC; Site-Specific Design, Design Implementation, Design Changes, Applicable Criteria from 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,"(Appendix B)**
Inspectable Areas	**Applicable IMC 2503 ITAAC Procedures, Applicable IMC 2504 Construction Program Procedures, Design Acceptance Criteria**

Cornerstone	**Procurement/Fabrication**
Objective	**To Independently Assess the Licensee's Methods To (1) Procure Material, Equipment, and Services, and (2) Control Materials, Parts, and Components during Fabrication**
Attributes	**Process Control, Material Control, Procedure Quality**
Areas To Measure	**ITAAC, Commercial-Grade Dedication, Receipt Inspection, Licensee's Evaluation of Suppliers, Applicable Criteria from Appendix B, Maintenance and Storage of SSCs, and Reports Required by Regulations**
Inspectable Areas	**Applicable IMC 2503 ITAAC Procedures, Applicable IMC 2504 Construction Program Procedures**

Cornerstone	**Construction/Installation**
Objective	**To Independently Assess the Licensee's Programs and Processes Developed and Implemented To Ensure the Construction and Installation of Facilities and Structures, Systems, and Components in Accordance with the Design**
Attributes	**Process Control, Material Control, Procedure Quality**
Areas To Measure	**ITAAC, Civil/Structural, Mechanical, Electrical, Welding, Maintenance and Storage of SSCs, Applicable Criteria from Appendix B, Reports Required by Regulations**
Inspectable Areas	**Applicable IMC 2503 ITAAC Procedures, Applicable IMC 2504 Construction Program Procedures**

Cornerstone	**Inspection/Testing**

Objective	**To Independently Assess the Licensee's Programs and Processes Developed and Implemented To Inspect and Test Programs, Facilities, and Structures, Systems, and Components**
Attributes	**Process Control, Material Control, Procedure Quality**
Areas To Measure	**ITAAC, ITAAC Closure, ITAAC Maintenance, Non-ITAAC Testing, Preoperational Testing, Applicable Criteria from Appendix B**
Inspectable Areas	**Applicable IMC 2503 ITAAC Procedures, Applicable IMC 2504 Construction Program Procedures**

Cornerstone	**Operational Programs**
Objective	**To Independently Assess the Licensee's Capability To Safely Operate the Facility**
Attributes/Areas To Measure	**Program Effectiveness** Emergency Preparedness, Radiation Protection, Process and Effluent Monitoring, Fire Protection, Preservice Inspection, Preservice Testing, Inservice Inspection, Inservice Testing, Environmental Qualification, Reactor Vessel Material Surveillance, Containment Leak Rate Testing, Maintenance Rule, Motor-Operated Valves, Quality Assurance (Operations), Operational Readiness **Training and Qualification** Reactor Operator Training, Reactor Operator Requalification, Nonlicensed Plant Staff Training
Inspectable Areas	**Applicable IMC 2504 Operational Program Procedures**

Cornerstone	**Security Programs for Construction Inspection and Operation**
Objective	**To Provide Assurance that (1) Construction Activities Are Not Adversely Impacted Due to Fitness-For-Duty Issues; and (2) The Licensee's Programs Use a Defense In Depth Approach and Can Protect Against the Design Basis Threat of Radiological Sabotage From Internal and External Threats and Prevent Theft or Loss of Radiological Materials**
Attributes/Areas To Measure **Note: Additional areas to measure will be added pending future construction security rulemaking**	**<u>Access Authorization</u>** Operational Program: Personnel Screening, Behavior Observations, Fitness for Duty Construction Program: Fitness for Duty **<u>Access Control</u>** Operational Program: Search; Identification

	<u>Physical Protection</u> Operational Program: Protected Areas and Vital Areas (Barriers, Alarms, Assessment) **<u>Contingency Response</u>** Operational Program: Protective Strategy Evaluation **<u>Material Control and Accounting</u>** Operational Program: Records, Reports, Procedures, Inventories **<u>Cyber Security</u>** Operational Program: Protection of Systems and Networks, Cyber Security Program, Plan and Procedures **<u>Protection of Safeguards Information</u>** Operational and Construction Programs: Access to SGI; Designation and Storage; Processing, Reproducing and Transmitting; Removal and Destruction
Inspectable Areas	**Access Control; Assessment and Detection; Contingency Plan and Compensatory Measures; Material Control and Accounting; Personnel Access, Fitness for Duty and Insider Mitigation; Physical Barriers; Programs and Procedures; Safeguards, Records, and Reports; Security Management Oversight**

Construction Significance Determination Process

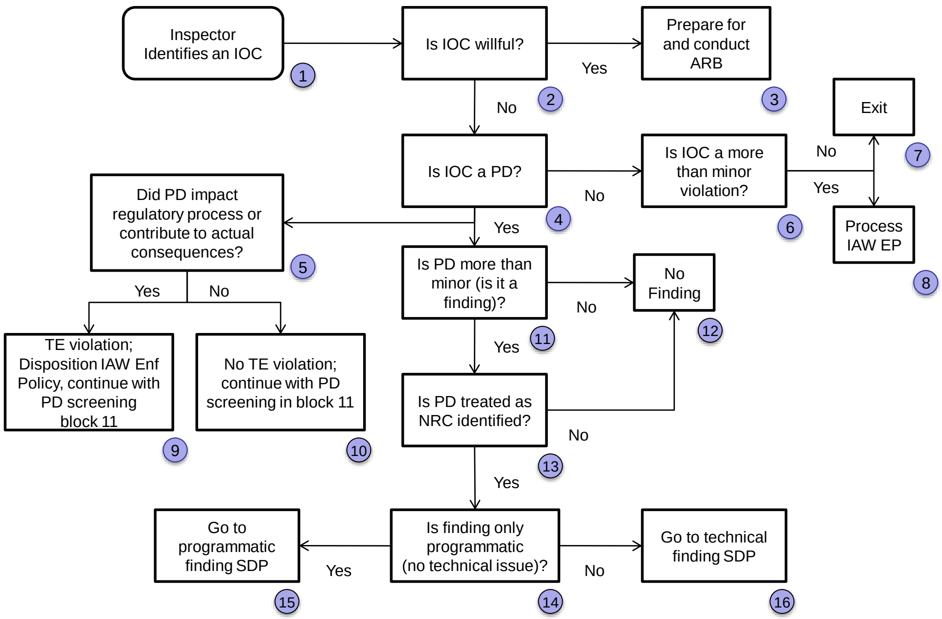
The overall objectives of the construction baseline inspection program are to provide a sufficient basis to support the Commission determination, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 52.103(g), that the acceptance criteria in a combined license have been met and to develop a level of confidence in the licensee's programmatic controls. Therefore, the construction inspection program is not limited to verifying the completion and closure of inspections, tests, analyses, and acceptance criteria (ITAAC) listed in the combined license. The U.S. Nuclear Regulatory Commission (NRC) must also consider inspection and assessment of construction programs and operational programs that are required to be developed and implemented by the licensee. Inspection findings from the baseline program are evaluated for significance and used to assess licensee performance. Unlike the Reactor Oversight Process (ROP), the significance of both licensee performance deficiencies and programmatic deficiencies needs to be determined in the construction Reactor Oversight Process (cROP).

The cROP working group, in close coordination with stakeholders, developed a flow chart for use in evaluating the significance of programmatic findings identified through the construction inspection program (CIP). The working group also developed two concepts for use in determining the significance of technical findings identified through the CIP. One concept would use a matrix to determine the significance of findings. A second concept would use a flow chart to determine the significance of findings. The staff plans to develop a security significance determination process (SDP) that is similar and analogous to the ROP security SDP. These proposed concepts require further work to fully develop and refine the methodology if the Commission determines that these options should be implemented. A description of the staff's proposed method to disposition construction inspection findings follows.

<u>Simplified Finding Screening Process</u>

The construction finding screening process begins with an issue of concern (IOC). The first step is to determine if an IOC is a willful violation warranting investigation by the NRC Office of Investigations. Then, the screening process proceeds to determine if the IOC is a performance deficiency (PD). A PD is an issue that is the result of a licensee not meeting a requirement or standard where the cause was reasonably within the licensee's ability to foresee and correct, and therefore it should have been prevented. A PD can exist if a licensee fails to meet a self-imposed standard or a standard required by regulation; thus, a PD may exist independently of whether a regulatory requirement was violated. Once a PD is determined to exist, two paths are taken. The first path is to determine whether the PD is associated with traditional enforcement (e.g., affects the regulatory process, associated with actual consequences) and the second path is to determine if the PD is of more than minor significance. If the PD is associated with traditional enforcement, that violation is processed separately from the underlying technical issue. If the PD is more than minor and is treated as identified by the NRC, the IOC is considered a finding and its significance is determined through the applicable SDP. A simplified finding screening process is shown below.

Simplified Finding Screening Process

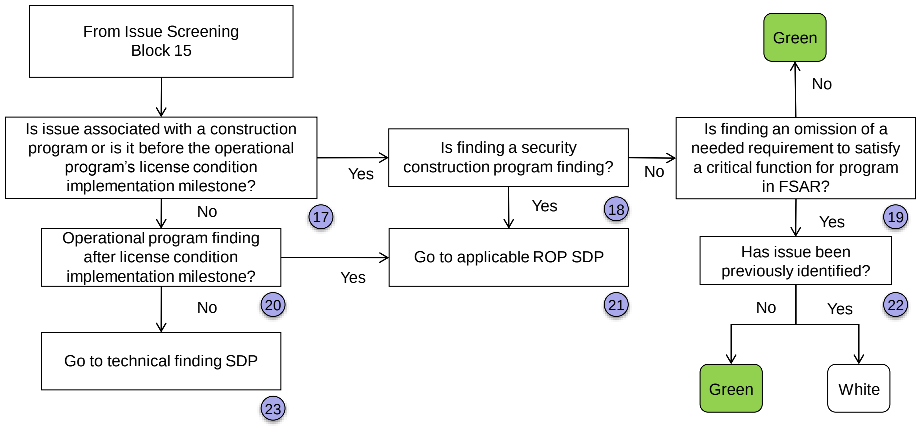


Programmatic Finding SDP

In most cases, it is anticipated that programmatic deficiencies will result in an underlying technical finding. In these cases, the technical finding will be processed through the technical finding SDP. However, there will likely be findings identified through the CIP that are primarily programmatic in nature. For instance, inspections will be conducted to determine if operational programs are developed in accordance with their description in the final safety analysis report (FSAR). Findings associated with these inspections will likely be programmatic findings.

The staff developed a simple flow chart for use in dispositioning construction programmatic findings. Once a finding has been processed through the finding screening flow chart above and is determined to be a programmatic finding, it is evaluated to determine if it is associated with a construction program or an operational program before the license condition implementation milestone. If it meets these criteria and is a construction security program finding, the security SDP will be used to determine significance. Other programmatic findings will be assessed against critical program functions listed in the final safety analysis report (FSAR). Findings associated with operational programs that have met the milestones in the license will be processed using the ROP SDP. If the finding has an underlying technical issue, then it is processed using the technical finding SDP. The proposed programmatic finding SDP is shown below.

Draft Construction Programmatic Finding SDP Flow Chart



<u>Technical Finding SDP</u>

Concept 1: Matrix Approach

Once a finding has been processed through the finding screening flow chart above and is determined to be a technical finding, it could be evaluated using a construction technical finding SDP. The SDP for inspection findings of degraded performance of structures, systems, and components (SSCs) in operating reactors uses as input the estimated impact on core damage frequency, large early release frequency, or both, along with the estimated duration of the degraded condition. This formulation is highly quantitative in nature and reasonably objective given the inputs that are assumed. For new reactor construction, it is not possible to replicate these elements. However, the use of a 2-dimensional matrix that includes a measure of the risk importance of the SSC or program element in question, along with the degree of nonconformance, would provide an objective, risk-informed, and performance-based significance determination for technical findings identified through the CIP.

The y-axis of the matrix would be a measure of the degree of nonconformance, which an inspector would determine by assigning a point value to each of several factors associated with the finding. For example, one set of factors might consist of the following:

- Quality of Construction
  - 3 points (e.g., findings involving substantial construction quality concerns)
  - 2 points (e.g., findings involving significant construction quality concerns)
  - 1 point (e.g., findings involving construction quality that are less serious but are of more than minor concern)

- Extent of Onsite Review Before Identification

  - 3 points (e.g., finding identified after all onsite review is complete)
  - 2 points (e.g., finding identified after second-level review is complete)
  - 1 point (e.g., finding identified after quality control review is complete)

- Corrective Actions

  - 3 points (e.g., repetitive significant condition adverse to quality)
  - 2 points (e.g., repetitive condition adverse to quality)
  - 1 point (e.g., prior opportunity existed to identify the condition)

The degree of nonconformance would be placed in the following category based on the sum of the points:

- High: 9 points
- Medium: 7–8 points
- Low: 5–6 points
- Minimal: 4 points or less

As the concept of the matrix approach is developed further, other factors may be included, e.g., the likelihood of identifying the deficiency prior to plant operations.

The x-axis of the matrix would be the risk importance of the system, design function, or program element impacted by the performance deficiency. Risk importance measures such as Fussell-Vesely (FV) and risk achievement worth (RAW) can be derived for relevant systems and/or functions from the probabilistic risk assessment (PRA) for all the new standardized reactor designs. An expert panel could use these risk-importance measures as a basis for determining the risk significance for each system in a respective certified design. The systems/functions could then be grouped into the following three categories based on their relative risk significance:

(1) Low Risk Importance

  - For example, the finding involves a design function, structure, or system with no components that are modeled in the PRA, or are modeled but have an FV value less than 0.005 and RAW less than 2.

(2) Intermediate Risk Importance

  - For example, the finding involves a design function, structure, or system with components with an FV value greater than 0.005 or RAW above 2.

(3) High Risk Importance

  - For example, the finding involves a design function, structure, or system with components with an FV value greater than 0.05 or RAW greater than 20.

The above FV and RAW ranges for each category are provided for illustrative purposes only.

Once the degree of nonconformance and the risk importance of the finding have been determined, the color of the finding would be determined by the corresponding row and column in the matrix:

Significance Determination Process Matrix

Degree of Nonconformance	Low Importance	Intermediate Importance	High Importance
High	**White**	**Yellow**	**Red**
Medium	**Green**	**White**	**Yellow**
Low	**Green**	**Green**	**White**
Minimal	**Green**	**Green**	**Green**

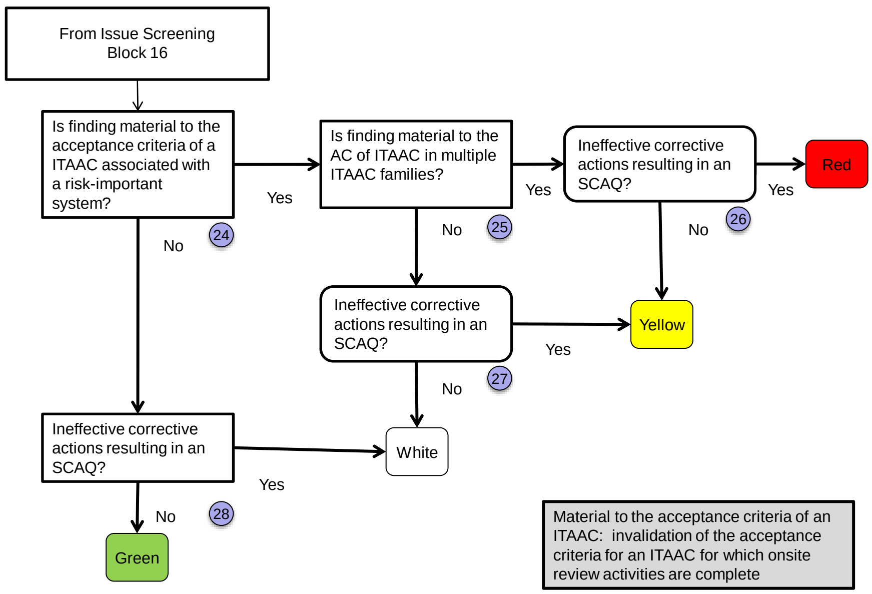
Risk Importance

While much of the development work had been completed by the staff in close coordination with stakeholders, both the risk importance and the degree of nonconformance measures require finalizing. The staff plans to convene an expert panel to determine the relative risk importance of systems or design functions in each certified design. The staff would then conduct a public workshop to develop specific guidance for use in assigning point values for each factor used in determining the degree of nonconformance. The staff would then conduct a tabletop exercise to ensure that the SDP matrix provides the expected results and is objective, predictable, transparent, and repeatable.

Concept 2: Flow Chart Approach

The staff developed a second approach to the construction technical finding SDP that employs a flow chart similar to the ROP's deterministic SDPs. In this approach, once a finding has been processed through the finding screening flow chart above and is determined to be a technical finding, it is evaluated to determine if it is material to the acceptance criteria of an ITAAC associated with a risk-important system. If it meets this criterion, it is evaluated to determine whether the finding is material to the acceptance criteria of ITAAC in multiple ITAAC families. The effectiveness of the corrective action program is taken into consideration during the evaluation. When repetitive significant conditions adverse to quality exist, the color of the finding is increased. The draft technical finding SDP is shown below.

Draft Construction Technical Finding SDP Flow Chart



SCAQ- Significant Condition Adverse to Quality

The staff has some work remaining to fully develop the construction technical finding SDP flow chart, such as defining risk-important systems and conditions adverse to quality. Similar to the work needed to finalize the matrix, the staff plans to convene an expert panel to determine the relative risk importance of systems in each certified design, conduct a public workshop to develop specific guidance for the use of the flow chart, and conduct a tabletop exercise to determine its effectiveness.

While the staff plans to develop both the construction SDP matrix and flow chart, to date, the matrix has provided the most flexibility in dispositioning different types of findings and has shown the most promise for success. Stakeholder feedback points to alignment of opinion that the implementation of the matrix is preferable over the flow chart.

As of: August 06, 2010	
Received: August 06, 2010	
Status: Pending_Post	
Tracking No. 80b2a620	
Comments Due: August 09, 2010	
Submission Type: Web	

PUBLIC SUBMISSION

Docket: NRC-2010-0230
Construction Reactor Oversight Process

Comment On: NRC-2010-0230-0001
Construction Reactor Oversight Process; Request for Public Comment

Document: NRC-2010-0230-DRAFT-0003
Comment on FR Doc # 2010-15321

Submitter Information

6/24/2010
75 FR 36124
(1)

Name: Thomas Houghton
Address:
1776 I Street, NW
Suite 400
Washington, DC, 20006
Organization: Nuclear Energy Institute

General Comment

NEI Comments on Construction Reactor Oversight Process Request for Public Comment

Attachments

NRC-2010-0230-DRAFT-0003.1: Comment on FR Doc # 2010-15321
NRC-2010-0230-DRAFT-0003.2: Comment on FR Doc # 2010-15321

SUNSI Review Complete
Template = ADM-013

E-RIDS = ADM-03
Add = K. Mattern (KSM)

NUCLEAR ENERGY INSTITUTE

Thomas C. Houghton
DIRECTOR
SAFETY- FOCUSED REGULATION
NUCLEAR GENERATION DIVISION

August 6, 2010

Ms. Cynthia K. Bladey
Chief, Rules, Announcements and Directives Branch
Division of Administrative Services
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Construction Reactor Oversight Process - Request for Public Comment: Docket ID NRC-2010-0230

Project Number: 689

Dear Ms. Bladey:

On behalf of the nuclear industry, the Nuclear Energy Institute (NEI)[1] offers the following comments in response to the June 24, 2010 *Federal Register Notice* (FRN) (*75 Fed. Reg. 36124*) regarding the construction reactor oversight process. The industry has appreciated the opportunity to participate in public meetings since December 2009 in the development of a construction reactor oversight process which the NRC staff is considering proposing to the Commission for the oversight of construction at new nuclear power plants.

The attachment to this letter provides our response to the seven specific questions posed in the FRN.

The industry first suggested a new approach to construction oversight to the NRC in a letter and white paper dated July 2, 2009 from Russ Bell to Glenn Tracy. Following a public "Construction Assessment Panel" meeting on November 16, NRC and industry each formed a working group. These groups have been meeting frequently in public to discuss aspects of the proposed new approach, which is based on

[1] NEI is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all entities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.

the key principles inherent in the reactor oversight process for operating reactors. The key objectives of the approach are to assess whether the plant has been built in accordance with the licensed design and that the operational programs are ready for operation. The process must be predictable and consistent in its oversight of the licensee, and must be transparent and understandable for the public.

Again, the industry appreciates the opportunity to provide comments for NRC's consideration as it proceeds in the development of a construction reactor oversight process which can be used to asses licensee performance during nuclear power plant construction.

If you have any questions, please contact me at (202) 739-8107; tch@nei.org.

Sincerely,

Thomas C. Houghton

Attachment

c: Mr. Luis A. Reyes, R-II, NRC
Mr. Glenn M. Tracy, NRO/DCIP, NRC
Mr. Timothy J. Frye, NRO/DCIP/CAEB, NRC
Mr. Thomas J. Kozak, NRO/DCIP/CAEB, NRC

Regarding
Construction Reactor Oversight Process:
Request for Public Comment
***75 Fed. Reg. 36124*, June 24, 2010**

Questions for Which NRC Is Seeking Input

(1) The staff has developed a draft of a new cROP regulatory framework, including cornerstone objectives, attributes and areas to measure (ADAMS Accession Nos. ML101050249; ML101050247). Are there important aspects of new reactor construction licensee performance that are not captured by the draft cROP regulatory framework?

We believe that the framework, cornerstone objectives, attributes and areas to measure provided in the referenced ADAMS documents are appropriate and sufficient for assessing the licensee's construction program and activities; in particular, the licensee's ability to construct the plant in accordance with the licensed design and the operational programs are satisfactory for operation. The framework provides a platform for the NRC to communicate with licensees and the public on the status of the construction program and the areas which NRC has assessed.

(2) Is there a role for construction performance indicators as an input into the assessment of licensee construction activities? If so, what aspects of licensee activities during construction could be objectively measured by a PI? What should be considered in determining performance indicators and their thresholds?

In the Reactor Oversight Program, the performance indicators complement inspection findings and provide objective evidence of performance. For example, they measure numbers of initiating events which could lead to core damage and the availability and reliability of mitigating systems equipment. We believe that there are significant differences between the mature operating industry, with its extensive data bases of operating experience and events, and new construction, which make the use of performance indicators problematic at this time. For example, there are no sets of data on construction performance. Without historical data, thresholds of performance, which would dictate points at which increased NRC inspection activity is warranted, cannot be set. Another problem is that without fuel on site, performance indicators are basically indications of cost and schedule, which are not relevant to the construction reactor oversight objectives or cornerstones. Despite these problems, industry supports the concept of using performance indicators to inform the oversight process. To that end, the industry recommends that the NRC defer the use of performance indicators until sufficient new reactor construction data is available to support the establishment of a meaningful performance indicator program.

(3) In the ROP, inspection findings are evaluated and given a color designation based on their safety significance using a risk-informed approach (the Significance Determination Process). What processes could be used to effectively and efficiently evaluate the safety significance of construction inspection findings?

Because there is no potential for core melt during new construction until fuel is loaded and criticality has been achieved, the ROP's core damage frequency significance determination process is not appropriate. However, work has been proceeding on two promising approaches to assessing performance based on the importance of the system, structure or components (SSC), and the degree, or extent, of deficiency with respect to (1) repeat items in the corrective action program, (2) the need for repair or replacement, and (3) to what extent the licensee has accepted the SSC. One approach uses a flowchart, similar in concept to several of the ROP SDPs; the other approach uses a matrix, one axis of which consists of the importance of the SSC and the other axis the degree of deficiency. At this point, the matrix approach may be preferable, but additional analysis and table top exercises are needed to confirm this position. Additional work is necessary to determine the appropriate metric for the importance of the SSC.

(4) For the cROP, the staff intends to use a Construction Action Matrix similar to the ROP to assess licensee performance. Is there a more effective and efficient alternative approach that could be taken? If not, what inputs should be considered in the Construction Action Matrix?

The construction action matrix, similar to the ROP action matrix, will allow NRC to predictably and transparently determine what level of additional inspection beyond the baseline inspection program is appropriate. It does this by considering both multiple performance deficiencies within a cornerstone, and individual more significant performance deficiencies. As in the ROP, this allows for a broad spectrum of NRC response for gradual, unchecked decline in performance, and for very significant individual performance deficiencies. Thus, each performance deficiency is assessed using the SDP to determine its unique importance, and a growing weakness in a particular cornerstone can trigger additional actions. For example, with only one white in a cornerstone, or only one white in multiple cornerstones, the licensee moves from the licensee response band to the regulatory response column. If there are multiple whites in a cornerstone, one moves to the degraded cornerstone column. We believe that the ROP structure is appropriate for use in the cROP.

(5) In the ROP, the NRC currently assigns safety culture component aspects to findings when appropriate. Substantive cross-cutting issues are identified when certain thresholds are crossed. Should the NRC treat findings in a similar manner in the construction environment?

A strong nuclear safety culture at a construction site, as at an operating plant, is essential. However, it is not clear that the current approach used in the ROP is appropriate for two reasons. First, industry has concerns whether the current ROP approach is effective. The industry has proposed an alternate approach to the NRC for operating plants. We will in the future present an alternative approach for new construction. The essence of the industry approach is that it should place the licensee in the lead role with NRC providing effective oversight. Second, the components and aspects of safety culture at an operating plant may not be a complete match with those at a construction site. Following the Commission's actions regarding a safety culture policy statement and accompanying traits, we will explore the specific traits (components and aspects) which are applicable to a construction site as opposed to an operating plant.

(6) When is the appropriate time to transition from the cROP to the ROP? What is the basis for this proposed transition point?

This is a complicated question which requires consideration of multiple issues. For example, at what point is the plant in a more operational and hence risk of core damage mode, as opposed to a construction and hence "is the plant being constructed in accordance with its design" mode? Is it more appropriate to transition at fuel load, or after being declared in commercial operation? (System testing and turnover, startup testing, etc. all require oversight; however, the purpose of this testing is to determine readiness, much like a post maintenance check, and failures, while not desired, are not unexpected and should not necessarily be considered performance deficiencies in the ROP sense. Another issue in determining the transition point is what works best for the efficiency and experience of inspection staff. Yet another is when will there be adequate data to implement the performance indicator program. In summary, we believe additional analysis and discussion is necessary to determine the answer to this question.

(7) In addition to the previously mentioned issues, commenters are invited to give any other views on the NRC assessment process that could assist the NRC in improving its effectiveness.

The industry appreciates NRC's thoughtful approach to developing the construction assessment process and its willingness to work with stakeholders to create the new approach. While we believe the approach chosen will reflect thoughtful analysis, it will continue to evolve due to unforeseen situations as we experience the new wave of construction. Thus, as the ROP, it will be a continuous improvement process. Therefore, we recommend that ongoing public meetings continue on some appropriate periodicity to address new issues.

Milestones for Option 3

Pending Commission approval, the staff plans to complete the following activities for Option 3:

Activity	Time To Complete after Commission Decision
Convene Expert Panel To Determine System Relative Risk Rankings for AP1000	6 months
Conduct Public Workshop To Complete Construction SDPs	6 months
Complete Tabletop Exercise	6 months
Complete Draft Guidance Documents	9 months
Complete Staff Training	12 months
Begin Pilot	After combined license is issued
End Pilot	12 months after pilot begins
Implement Revised cROP or Provide Revised Options to Commission Based on Pilot Results	3 months after pilot ends