ITAAC Closure and Verification Demonstration Final Report

June 1, 2017

Office of New Reactors, Division of Construction Inspection and Operational Programs
and
Region II, Division of Construction Oversight

Executive Summary

U.S Nuclear Regulatory Commission (NRC) staff completed a demonstration project to evaluate the readiness and reliability of the Inspection, Tests, Analyses, and Acceptance Criteria (ITAAC) inspection and verification processes, specifically during the last year of construction for the new units at the Vogtle Electric Generating Plant and Virgil C. Summer Nuclear Station. This report documents the recommended process and organizational changes identified during the demonstration, as well as the associated communication strategies.

The ITAAC verify that the plant has been constructed in accordance with the license. By their very nature, many ITAAC will not be completed until late in construction, when the structures and systems are fully installed and available for inspections, tests, and analyses. For this reason, the NRC expects a surge in construction inspections and ITAAC closure notification (ICN) submittals during the latter part of each unit's construction.

The demonstration project was comprised of two components. First, the working group reviewed existing NRC processes and procedures for ITAAC inspection and ICN closure verification review and identified additional enhancements to the processes and organizational structures. Second, the working group used the licensee's construction schedules from February 2017 with respect to key milestones and developed peak work load scenarios to exercise the procedures and processes to determine if they were reliable, efficient, and capable of meeting the ITAAC closure demands. .

As part of this effort, the NRC conducted a Category II public meeting on April 24, 2017, described in a memo dated May 18, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17129A262), to demonstrate the agency's capacity to complete ITAAC inspections and notification reviews and validate the agency's agility and decision-making processes for handling peak workloads. NRC staff presented several strategies, such as re-distribution of work to accommodate priorities and cross train additional ICN reviewers and inspectors to maintain capacity, to illustrate how the agency will manage the peak workloads. The meeting provided an opportunity for licensees and other public stakeholders to provide feedback on the demonstration and proposed recommendations.

The recommendations identified in this demonstration project will result in enhancements that will refine current NRC processes regarding capacity, agility, and decision making in support of the Title 10 of the Code of Federal Regulations (10 CFR) 52.103(g) decision, which allows fuel load.

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1.0 Introduction

In July 2011, the U.S. Nuclear Regulatory Commission (NRC) issued the final report from the Department of Energy sponsored "Simulated Inspections, Tests, Analyses, and Acceptance Criteria Closure Verification Demonstration" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11166A182). The purpose of this initial demonstration project was to verify the reliability and efficiency of both the industry's and the NRC's processes for the closure and verification of inspections, tests, analyses, and acceptance criteria (ITAAC).

The ITAAC verify that the plant has been constructed in accordance with the license. By their very nature, many ITAAC will not be completed until late in construction, when the structures and systems are fully installed and available for inspections, tests, and analyses. For this reason, the NRC expects a surge in construction inspections and ITAAC closure notification (ICN) submittals during the latter part of each unit's construction.

The NRC implemented the recommendations from the 2011 demonstration project and has already learned several lessons implementing these first-of-a-kind activities. To ensure that the agency is fully prepared to meet its mission during peak construction inspection and ITAAC closure notification (ICN) workloads, the Director of the Office of New Reactors (NRO) and the Regional Administrator for Region II issued a tasking memorandum on February 22, 2017 (ADAMS Accession No. ML17055A534), to evaluate the NRC's processes for ITAAC inspection and ICN closure verification. The purpose of this demonstration project is to evaluate the NRC's processes and provide recommendations to maximize its effectiveness and efficiency in meeting the ITAAC closure demands; and to identify focus areas and provide recommendations on how NRC process and organizational structures be enhanced to support ITAAC closure demands.

During this demonstration, the working group reviewed each step of the ICN process to evaluate the current procedures and processes during nominal construction activity timeframes. As part of this effort, the NRC conducted a Category II public meeting on April 24, 2017, described in a memo dated May 18, 2017 (ADAMS Accession No. ML17129A262), to demonstrate the agency's capacity to complete ITAAC inspections and notification reviews and validate the agency's agility and decision-making processes for handling peak workloads. NRC staff presented several strategies, such as re-distribution of work to accommodate priorities and cross train additional ICN reviewers and inspectors to maintain capacity, to illustrate how the agency will manage the peak workloads. The meeting provided an opportunity for licensees and other public stakeholders to provide feedback on the demonstration and proposed recommendations.

The recommendations identified in this demonstration project will help the NRC enhance the current NRC process by maintaining the agency's capacity, agility, and decision making to support of the decision under Title 10 of the *Code of Federal Regulations* (10 CFR) 52.103(g) , which allows fuel load.

2.0 Objective and Approach

The objective of this demonstration project was to identify potential gaps or unanticipated challenges associated with the NRC's ITAAC inspections and ICN review processes.

The project focused on the last 12 months of construction for each unit, as shown in the public meeting presentation slides for the April 24, 2017, demonstration (see Enclosure 2, specifically slide 15 and Figure 1 below).

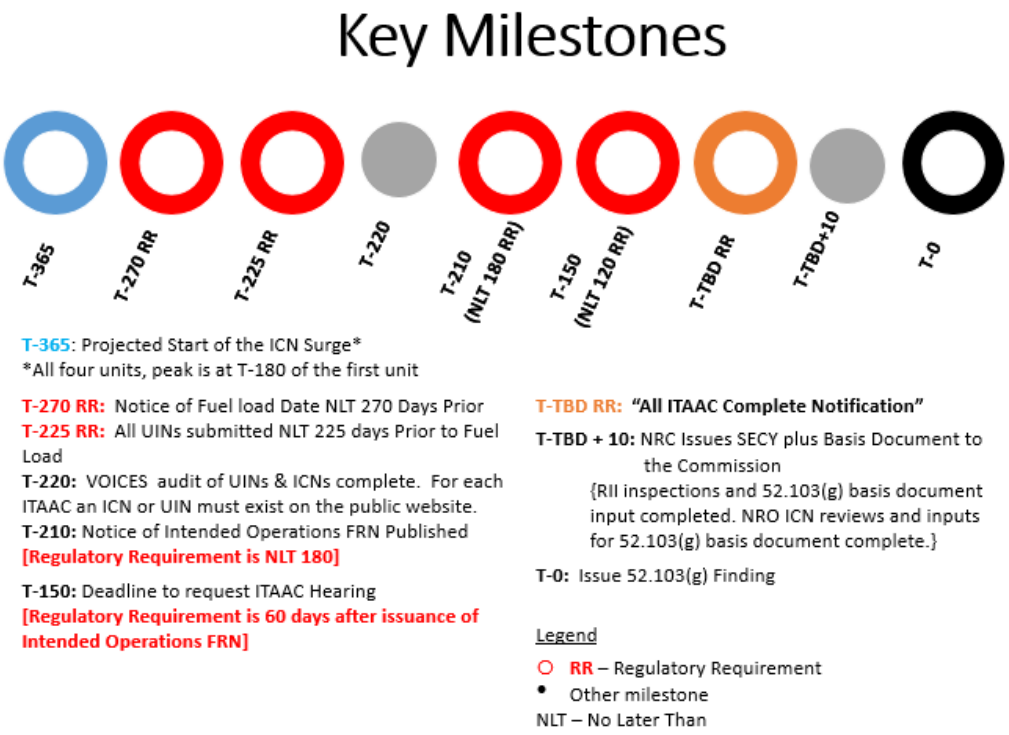

Figure 1 – Key Milestones

Because the completion of ITAAC verifies that the plant was constructed in accordance with its license, many ITAAC will not be completed until late in construction when the structures and systems are fully installed and available for inspections, tests, and analyses. This will result in a "surge" of ITAAC inspections followed by a "surge" of ICN submittals during the last year of construction of each unit. This demonstration project focused primarily on the expected surge for the four units and verified that the staff has the necessary resources to meet the expected demand for inspections and ICN reviews.

The demonstration project was comprised of two components. First, the working group reviewed existing NRC processes and procedures for ITAAC inspection and ICN closure verification review and identified additional enhancements to the processes and organizational structures. Second, the working group used the licensee's construction schedules from February 2017 with respect to key milestones and developed peak work load scenarios to

exercise the procedures and processes to determine if they were reliable, efficient, and capable of meeting the ITAAC closure demands.

Key outputs from this effort included:

1. recommendations regarding the NRC's ITAAC process and logistical enhancements
2. communication tools to ensure a common understanding of the ITAAC closure process amongst licensees and external stakeholders
3. validation of the primary resources needed to process the expected ITAAC inspection and ICN review surges

This report documents the recommended process and organizational changes identified during the demonstration, as well as the associated communication strategies.

3.0 Focus Areas and Recommendations

Based on the outputs of the demonstration and interactions with the industry and the public, the working group identified 23 recommendations to effectively and efficiently meet the ITAAC inspection and ICN review demands expected towards the end of construction.

3.1 ITAAC Closure Notification Process

Summary of Demonstration Topic

The NRC reviews all ICNs to verify that the licensee has successfully completed the ITAAC. The agency must complete this review for all ITAAC before issuing the 10 CFR 52.103(g) finding, which allows fuel load. This demonstration effort included staff review of the steps in the ICN review process, and identified areas that can be improved.

As the working group prepared for the demonstration, it discussed and analyzed each step of the ICN process for factors such as processing times, work load volume,, resource requirements, and sequencing of steps. The group determined capacity and risk for each step of the process, which led to the identification of areas which could potentially impede the verification process. These areas were displayed in process maps developed for the demonstration. Steps tagged for future evaluation are addressed in the following focus areas.

The working group reviewed existing NRC processes, guidance documents, and interfaces that are involved in verifying an ICN. Using nominal timeframes for performing routine activities, the group developed step-by-step process maps for the ITAAC closure documentation. Additional information can be found in Enclosure 2, specifically in slides 6-17 and slides 50-59.

Focus Area: *Enhance and adapt ICN workflows for timely ICN reviews.*

Given that NRC staff and the licensees are implementing this process for the first time, the NRC determined that it will be critical to let the ICN review process evolve through frequent and routine interaction with the licensees to resolve critical issues. The NRC staff will continue to rely on weekly public meetings for early resolution of ICN issues. The weekly meeting serves as an important communication tool to facilitate discussions between NRC staff and the licensees to raise issues and provide a path forward. These meetings could be held more frequently during the ICN surge period.

Additionally, to ensure lessons learned from this demonstration effort are institutionalized, the NRC staff will revise its guidance in applicable NRO office instructions, based on the results of this demonstration effort. This revised guidance will enable staff to resolve ITAAC closure issues more consistently in the future. The revision to NRC office instruction NRO-REG-103, "Inspections, Tests, Analyses, and Acceptance Criteria Closure Verification Process," dated November 13, 2012 (ADAMS Accession No. ML12088A040), will be made publically available to allow stakeholders to gain insights into the NRC's ICN review process. The office instruction will be revised to include recommendations for technical reviewer referral criteria during the reviews of ITAAC notifications. Also, the necessary completion percentage of targeted ITAAC required for final verification of non-targeted ITAAC within an ITAAC family will be revisited, as will the involvement of technical staff for all ITAAC notifications related to security and emergency-preparedness.

Focus Area: *Address challenges associated with the quality and content of ITAAC notifications.*

The mutual understanding of NRC guidance is an important step in ensuring that the NRC's ITAAC closure review process is prompt and comprehensive. The working group identified opportunities to enhance NRC guidance by making it clearer and more consistent. For example, NRC staff and licensees had substantive discussions on the importance of, and challenges associated with, the level of detail included in an ICN and an uncompleted ITAAC closure notification (UIN). Additionally, the staff and licensees discussed the "intent" of ITAAC during the demonstration, and staff noted that this topic was also visited extensively during the 2011 ITAAC demonstration, particularly for Functional Arrangement ITAAC, Report ITAAC, and Design Reliability Assurance Program ITAAC. The NRC suggested that combined license, design certification, and early site permit applicants should consult Regulatory Issue Summary 2008-05, Revision 1,"Lessons Learned to Improve Inspections, Tests, Analyses, and Acceptance Criteria Submittal," dated September 23, 2010 (ADAMS Accession No. ML102500244) for guidance on ITAAC content, nomenclature, and language. The NRC advised that combined license holders should consult Nuclear Energy Institute (NEI) 08-01, "Industry Guideline for the ITAAC Closure Process under 10 CFR Part 52," Revision 5, dated June 30, 2014 (ADAMS Accession No. ML14182A158) for guidance on the content of ITAAC notifications. Increased communications with licensees may contribute for future success in resolving issues on ITAAC intent and the level of detail to be included in ICNs and UINs. The

NRC staff will establish a process for documenting discussions and responses to questions in a "frequently asked questions" (FAQ) format on issues associated with the content of ICNs and UINs, which may result from gaps in existing guidance or discrepancies in interpretation.

During the demonstration, the licensees asked why the NRC could not rely on information in NRC inspection reports to conclude that a licensee has met the sufficient information requirement for ITAAC notifications in 10 CFR 52.99(c). The NRC staff responded that the 10 CFR 52.99(c) requirement applies to the licensee's ITAAC notification, and it is the licensee's obligation to meet this requirement. Information in an NRC inspection report that is not included in the ITAAC notification does not satisfy the licensee's obligation.

Focus Area: *Provide tools to track the status of ITAAC closure notifications to support timely ICN reviews.*

Verification of ITAAC Closure, Evaluation, and Status (VOICES) is a tool to track ICN workflows and manage ICN reviews. The working group recommends the development of internal performance dashboards for VOICES to track the status and timeliness of ICN reviews to assure appropriate management attention on challenging issues. This will allow for more immediate identification of issues and will be a useful graphical interface tool to inform NRC staff and management of the overall ICN review status.

Recommendations

1. Utilize weekly public meetings to facilitate resolution of critical issues associated with ICN and UIN reviews, including items such as the intent of an ITAAC, ICNs with challenges, methods for resolution of issues, and informed decision making.

2. Develop an FAQ format process to document decisions and clarify staff positions on ITAAC closure guidance documents.

3. Revise applicable NRO office instructions to ensure lessons learned and enhancements for the ICN process, identified during this demonstration project, are institutionalized. The revision should include, but is not limited to, the development of the criteria of when technical reviewer referral is needed during the reviews of ITAAC notifications, the evaluation of the requirement of completing half of targeted ITAAC before completing verification of non-targeted ITAAC within an ITAAC family, and the involvement of technical staff for all ITAAC notifications related to security and emergency-preparedness.

4. Make the revised NRC office instruction NRO-REG-103 publicly available to give stakeholders insight into the NRC's ITAAC notification review process.

5. Develop internal performance dashboards for VOICES to track the status of each step for ICN reviews.

3.2 ITAAC Inspection Process

Summary of Demonstration Topic

The performance of ITAAC inspections to support the ITAAC notification review process assures the NRC that the licensees are in compliance with the ITAAC requirements. This demonstration effort has allowed the staff to review the steps in the ITAAC inspection process, and identified areas for improvement of the inspection program.

The working group reviewed existing NRC processes, guidance documents, and interfaces associated with ITAAC inspections, including technical assistance requests (TARs), unresolved items (URIs), ITAAC inspection findings, allegations and petitions, and ITAAC post closure notifications (IPCNs). Using nominal timeframes for performing routine inspection activities, the working group developed detailed step-by-step process maps for ITAAC inspection activities.

As part of the demonstration, the NRC staff described the ITAAC inspection process, which includes initiators such as TARs and URIs, inspection guidance, performance of ITAAC inspection activities, declaration of the ITAAC inspection completion in the Construction Inspection Program Information Management System (CIPIMS), and completion of inspection reports.

The demonstration exercised the process for handling different types of inspection results and outcomes, including ITAAC findings that affect the acceptance criteria. The working group considered existing nominal timeframes for performing routine activities established by the construction reactor oversight process (cROP), key decision making aspects of the existing NRC programs and guidance and how these supported NRC staff's agility, especially in the period near the end of construction and close to the issuance of the 10 CFR 52.103(g) finding. Additional information can be found in Enclosure 2, specifically in slides pages 19-25 and slides 60-62.

As a result of the demonstration project and feedback from the public meeting, the NRC identified recommendations that support construction inspection capacity; enhance the agency's agility in responding to inspection initiators, activities, and outcomes; and highlight the decision making process through the use of a performance dashboard.

Focus Area: *Focus on the safety mission while considering enhancements that would result in more timely identification and resolution of concerns or findings that are material to ITAAC.*

While reviewing the ITAAC inspection process and the associated nominal timeframes for key activities, the staff found that in the time period when the ITAAC surge begins to the 10 CFR 52.103(g) finding, processes should support NRC staff's agility to promptly address and resolve safety issues associated with ITAAC.

During the project preparation, the working group examined each step of the ITAAC inspection process, including inspection initiators and outcomes, using existing governing documents with nominal timeframe requirements. Examples of these are the processing of allegations, processing of more-than-minor inspection findings, and resolving TARs, URIs, and IPCNs. The working group verified that implementing documents provided guidance to the staff to support the agency's agility. Where gaps were identified, the working group made recommendations to provide additional guidance, process clarity, and enhancements to streamline decision making steps.

As part of the project, the working group reviewed the TAR process and its effects on the ITAAC inspection process. Specifically, the TAR process is an internal NRC process between inspectors in the field and Headquarters technical staff that documents clarification on technical positions and Headquarters requests for special inspections. For some time, the challenges with the TAR process have been discussed, both from an internal NRC and an external licensee perspective. During this project, the group specifically looked for areas that could impact the NRC's agility and decision making needed to support an accurate and timely 10 CFR 52.103(g) decision. Examples of these learnings include the need for established timeframe requirements for processing a TAR, including early interactions between NRC offices to ensure a technical position conclusion adequately addresses the initiator's concern to support prompt resolution of issues. The licensees specifically expressed interest in the TAR process with respect to the frequency it is being used, status of actions, and results being publicly available.

Focus Area: *Enhance existing inspection processes to assure timely disposition of ITAAC inspection results to support ITAAC closure verification.*

While reviewing the ITAAC inspection process, the staff found that in the time period when the ITAAC surge begins to the 10 CFR 52.103(g) finding, the inspection disposition process should support NRC staff's agility for ITAAC closure verification. For example, after an inspection is completed and the outcome (e.g., a finding) has been dispositioned, the inspection results should be promptly documented and made publicly available, in accordance with NRC processes and governing documents. The construction reactor oversight process establishes the nominal timeframe for integrated inspection report issuance as being on quarterly basis, which could be 25 to 135 days from date of the inspection exit. As a result, the nominal timeframe for quarterly inspection report issuance is not timely or supportive of NRC staff's agility.

During the project preparation, the working group found areas where additional guidance, process clarity, and enhancements of existing inspection processes could result in timely disposition of ITAAC inspection results. In addition, following the NRC's demonstration of the ITAAC inspection process, the staff and licensees discussed the timeliness of ITAAC inspection reports during the surge, stand-alone inspection report issuance, and ITAAC inspection results and documentation requirements prior to the NRC determining an ITAAC is complete. As part of the recommendation for this focus area, the working group will identify the specific

documentation for ITAAC inspection results that is needed to support ITAAC closure verification and the issuance of the 10 CFR 52.103(g) finding.

Focus Area: *Provide tools to inform the status of the ITAAC inspection process to support timely ITAAC inspection results.*

From the demonstration, the working group determined that developing a performance dashboard would improve and better communicate the NRC decision-making.

Metrics currently exist to track inspection process activities to verify that the staff meets the nominal timeframe requirements. However, to support ICN reviews during the ITAAC surge, nominal timeframes for routine inspection processes may not be timely or applicable. For example, when an URI is identified during an inspection, NRC guidance establishes the nominal timeframe for staff's resolution of an URI including the disposition of the results (i.e. no finding or finding) as six months from the date of the inspection exit. If an URI results in a finding that is material to the acceptance criteria of an ITAAC, the issue could directly affect the NRC's ability to make a 10 CFR 52.103(g) decision in a timely manner. As a result, the nominal timeframe of six months for URI processing is not timely or supportive of the NRC staff's decision making.

As previously discussed, the working group recommends enhancements to governing documents for NRC processes, like URIs, which would include more applicable timeframes during the surge for the key activities associated with the ITAAC inspection process. The working group also recommends that a performance dashboard be created to highlight key ITAAC inspection activities with applicable timeframes that will allow for more immediate identification of issues, communicate challenges on an accelerated schedule, and support prompt resolution of issues.

Recommendations

6. Enhance/develop NRC processes, including associated governing documents, communications, and training, to ensure timely identification and resolution of concerns or findings material to ITAAC, such that ITAAC inspection results support key activities and milestones in the ITAAC closure verification process.

    a. Enhance/develop the following processes: TARs, URIs, ITAAC inspection findings, allegations and petitions, and IPCNs.
    b. For inspection findings, consider enforcement actions and internally and externally disputed findings. Consider which NRC process activities, if any, can be done in parallel with the evaluation of an ITAAC technical concern.

7. Enhance the TAR process. Specifically consider the frequency of performing this process; the timeliness of TAR processing; and interactions with licensees for visibility purposes.

8. Establish timeliness requirements for inspection disposition including inspection completion in CIPIMS and inspection report issuance to support the ITAAC surge and the 10 CFR 52.103(g) finding.

9. Develop and implement a performance dashboard for early identification of ITAAC closure related issues for management attention and resolution. Consider key aspects of the inspection process, including the timeliness of report issuance, inspection initiators, and inspection outcomes.

3.3 ITAAC Surge Inspection Demonstration

Summary of Demonstration Topic

The planning, inspection, and documentation of ITAAC inspections are inputs to the ICN review. To declare that the inspection is complete for an ITAAC, the NRC inspects construction activities as they progress, following Inspection Manual Chapter (IMC) 2503, "Construction Inspection Program: Inspections of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)." As construction progresses, the licensees complete ITAAC. Therefore, the ITAAC inspection surge will lead the ICN review surge for most ITAAC. It is important for the NRC to plan and schedule inspections as construction progresses.

To evaluate the NRC's preparedness to conduct the required ITAAC inspections, the NRC staff developed three scenarios. These scenarios were intended to test the bounds of the NRC's capacity to conduct ITAAC inspections. The scenarios provide the most comprehensive look at the potential variance in ITAAC inspection timing (see Enclosure 2 slide 27 for a description of the scenarios).

These scenarios were developed by shifting the remaining ITAAC inspections in the Primavera inspection schedule for each unit to coincide with the forecasted construction activities. The resource needs include all inspections, project management, and estimates for emerging events. Enclosure 2 slides 29-31 list the projected inspection needs and capacity. The most challenging scenario was scenario 1, which had different 10 CFR 52.103(g) dates for all 4 units. This is due to earlier completion of the first unit. However, the NRC does have sufficient resources to accommodate the construction schedule projected in all the scenarios.

Focus Area: *Maintain inspection scheduling flexibility*

The ITAAC inspection schedule information provided in Enclosure 2 slides 29-31 is based on inspections being performed as early as possible. Many of the inspections can be moved to different phases of system construction thereby providing additional agility for inspection. Inspection planning and scheduling is accomplished using CIPIMS and Primavera. NRC puts an additional focus on inspections that are dependent on short duration construction activities (e.g., preoperational tests). Some inspection of licensee documents (e.g., licensee procedures and test results), although not a time-sensitive task, may need to be coordinated within the NRC and with the licensee to avoid impacting other time-sensitive inspections (e.g., observation of a

preoperational test). These inspections, which are not directly related to construction, may be conducted in the NRC offices to reduce travel time or at another offsite location for ease of communication with licensee or contractor staff.

To ensure that inspections are scheduled and performed at an appropriate time, NRC management oversees the construction project managers and inspectors through periodic assessments and construction status meetings. As construction nears completion, NRC management may need a quicker and more comprehensive method to identify and resolve potential scheduling or inspection resource issues related to ITAAC inspections.

Focus Area: *Maintain qualified inspection staff*

Currently, the Region II Division of Construction Oversight inspection staff is qualified to perform inspections at 10 CFR Part 52 reactors following qualification in accordance with IMC-1252, "Construction Inspector Training and Qualification Program." The NRC is currently evaluating consolidation of construction inspection training requirements in IMC-1252 within IMC-1245, "Qualification Program for New and Operating Reactor Programs." Some inspectors in Region II and NRO are currently cross-qualified.

Recommendations

10. Determine the most efficient location and time for inspections. Continue to focus on short-duration construction activities, such as installing the reactor vessel, which are unlikely to be repeated for additional inspection opportunities.

11. Enhance the NRC decision-making process by developing performance dashboards to identify any potential inspection scheduling or resource issues to management for early resolution.

12. Establish an inspection scheduling process to verify that test procedure inspections are scheduled when procedures are issued and available versus when the tests are being performed.

13. To ensure continued inspection capacity including expanded inspection support during preoperational testing, Region II will develop a cross-qualification process and train additional inspectors in ITAAC inspections to expand inspection capacity. The NRC will incorporate construction inspector training into IMC-1245 and continue cross-qualification for inspectors at plants operating under 10 CFR Part 52.

3.4 ITAAC Closure Notification Surge Demonstration

Summary of Demonstration Topic

Following the inspection surge, a critical timeframe will be the surge in ITAAC notification submittals during the last 12 months before completion of a unit's construction. The three

scenarios created for the inspection surge demonstration were also used for the ICN surge demonstration. These scenarios were intended to test the bounds of the NRC's capacity to review ICNs and provide a comprehensive look at the potential variance in peak workloads. The most challenging scenario for the ICN surge demonstration was scenario 2 which had the same 10 CFR 52.103(g) dates for all 4 units. This is because the volumes of ICN submittals are greatest for all 4 units during the same 12 month period. By utilizing the mitigating strategies discussed below, the NRC has sufficient resources to accommodate the ICN submittal schedule projected in the 3 scenarios.

For the purposes of the demonstration, the working group assumed an ICN review capacity based on three dedicated staff, which is less than the currently allocated resources for ICN reviews. This base capacity is shown on the surge graphs (Enclosure 2 slides 37-39) as a solid line; the dashed line represents the projected future resources. Variables were also introduced into the model to simulate expected and realistic conditions. Because of the number of complex ITAAC expected during the last months of construction, the simulation decreased the ICN review rate by 20 percent for the final 6-month period. As the lead unit completes construction and receives its 10 CFR 52.103(g) finding, the remaining units under construction will likely use notifications similar to those previously accepted for the lead unit. The simulation reflected this as a 33 percent increase in review capacity, since reviews of these notifications will be simplified. Last, the model assumed a resubmittal rate for notifications, which was estimated at 15 percent for the lead unit and 5 percent for the remaining units. The lower resubmittal rate for the lag units is based on the expected lessons learned and information used from the lead unit. The resubmittals are introduced into the scenario schedules using a 2-month lag.

Enclosure 2 slides 35-41 show the projected ICN review capacity and expected submittal rates. As shown in Enclosure 2 slides 38-39, for a minimal number of months, the ITAAC notification submittals exceed the base capacity of reviewers. The mitigating strategies discussed below offer insights into how the NRC staff will manage these peak months.

Focus Area: *Respond to changes in construction schedules to support ICN review*

The demonstration project identified critical months during the scenarios when the projection of submitted ITAAC notifications exceeded the agency's base capacity to review them. However, the NRC has mitigating strategies in place to handle these peak months, including the ability to prioritize work and focus on a lead unit.

Another mitigating strategy is to establish and maintain an expanded capacity of additional reviewers. It is recommended that additional staff continue to be cross-trained to maintain capacity in diversified skill areas to support ICN workflow capacities. Also, discussion of expected submittal workloads should be a standing agenda item for the weekly public meeting to permit early notification of critical process points and resource needs.

A discussion during the demonstration focused on establishing expectations for the completion of complex ITAAC. Complex ITAAC can generally be described as having highly involved inspections, tests, or analyses to support a complicated design commitment. Many complex

ITAAC cannot be completed until a significant amount of construction is finished. The NRC staff will work with stakeholders to identify complex ITAAC issues by reviewing early submittals of uncompleted ITAAC notifications and develop clear expectations for the content of the associated ICN submittals.

The NRC staff recognizes that regularly scheduled discussions with licensees are beneficial for resource planning purposes. A standing agenda item for the weekly public meeting will lead to better advance notice of high volume submittals and other issues associated with ITAAC notifications.

Recommendations

14. Cross-train additional staff to support ICN workflow capacities during the surge, including the forecasting of needed technical reviews.

15. Work with stakeholders to identify complex ITAAC issues by reviewing early submittals of uncompleted ITAAC notifications and develop clear expectations for the content of the associated ICN submittals. This effort will include identifying when complex ITAAC will be completed during the construction schedule.

16. Establish standing agenda items during the weekly public meeting to discuss expected ICN submittal workloads to allow early notification of resource needs and critical process points.

4.0 Additional Staff Identified Recommendations

The working group reviewed and evaluated existing NRC processes and procedures for each of the four significant areas of interest: ICN process; ITAAC inspection process; ITAAC surge inspection; and ICN surge. For each process activity, the demonstration project evaluated the most limiting factors, which included staffing capacity, specialized training requirements, process transitions across organizational boundaries, and nominal timeframes for routine activities. The working group examined each step of the ITAAC inspection process and identified opportunities for additional guidance, process clarity, and enhancements that could streamline decision making steps.

As a result, the staff recommended tools to inform the status of key activities of the ICN verification and inspection process in each of the areas. Specifically, the working group recommended the creation of a highly visible, internal color-coded performance dashboard designed to track key ICN verification and inspection process activities and steps. The advantage of an integrated dashboard is that individual dashboards can become compartmentalized and may not represent the current overall health or status of an entire program. The color coding for each key activity should be sensitive enough to identify any impacts from the most limiting factors in each activity at an early stage. The change in performance dashboard colors needs to reflect a graded approach to NRC decision-making and elevating issues to NRC management for resolution. This will allow for more immediate

identification of issues, and will be a useful graphical interface tool to inform NRC staff and management of the overall ICN process status. The staff recommends the performance dashboard be established and used at least 12-months before projected fuel load. Figure 2 below provides a conceptual example of a potential dashboard.

Performance Dashboard:

For concept only, this is a potential dashboard.

NRC Processes Associated With ITAAC Completion			
ITAAC CLOSURE PROCESS	**STATUS**	**ITAAC INSPECTION ACTIVITIES**	**STATUS**
(A.1) Process Document Submittals		**(B.1)** Perform Inspection Activity (Includes Prep/Doc)	
(A.2) Creating ICN Records in VOICES		**(B.2)** Technical Assistance Requests (TARs)	
(A.3) ICN/UIN Reviews		**(B.3)** Unresolved Items (URIs)	
(A.4) Generates FRN and Insufficient Info/Potential Problem Letters		**(B.4)** ITAAC Finding Affects AC	
(A.5) Processes FRN		**(B.5)** Late Filed Allegations/Petitions	
(A.6) Insufficient Info/Potential Problem Letters		**(B.6)** ITAAC Post-Closure Notifications (IPCN)	

For example:

Dashboard Bases Document	**METRIC COLOR EQUIVALENTS**		
	GREEN	**YELLOW**	**RED**
(A.3) Metric for ICN/UIN Reviews	ICN/UIN review open X days	ICN/UIN review open for Y days	ICN/UIN review open for Z days
(A.3) ADDITIONAL ACTION REQUIRED:	None	Notify Division Director and do ….	Notify Office Director and do….

Figure 2 – Performance Dashboard

The working group also recommends that senior management should establish a temporary organizational structure with senior executive leadership approximately 12-months before projected fuel load. This organization would provide oversight and coordination to ensure appropriate decision making and the prompt identification and resolution of issues.

Recommendations

17. Create an integrated, highly visible, internal, color-coded performance dashboard to track the key ICN verification and inspection process activities and steps.

18. Establish a temporary organizational structure with senior executive leadership approximately 12-months before projected fuel load. This organization would oversee and coordinate the ITAAC closure verification process to ensure appropriate decision making and the prompt identification and resolution of issues.

5.0 Strategies Going Forward

5.1 Communications

Discussions at the end of the meeting yielded valuable insights, including communications enhancements that will increase the exchange of information with licensees and stakeholders, and establish a means to record resolutions of issues.

Staff and licensees agreed that the interactions in weekly public meetings have been meaningful and helpful in resolving issues associated with the ICN review process. Licensees and staff discussed establishing additional public meetings to facilitate the resolution of emerging issues pertaining to ITAAC closure.

As mentioned in section 3.1, licensees and staff agreed to develop a process to document discussions and responses to questions in a "frequently asked questions" format regarding issues associated with the content of ICNs and UINs, which may be due to gaps in existing guidance or interpretation discrepancies. This process will provide a forum for resolving issues that can be accessed later as needed.

In an effort to provide transparency to the NRC's ITAAC process, the NRC staff will provide external stakeholders with access to key aspects of, and updates on enhancements made to the process. This will be accomplished by creating and maintaining a publicly available message map, similar to the process maps developed for this demonstration. This new message map will be available on the public website by the 4th quarter of 2017.

Also, to revisit discussions explored during this demonstration and identify new challenge areas, licensees are interested in conducting public workshops beginning in 2018.

Recommendations

19. Increase the frequency of public meetings to accelerate the resolution of emerging ITAAC closure issues..

20. Create an FAQ-type process that provides a forum to document discussions and resolutions of issues associated with the content of ICNs and UINs, which may be due to gaps in existing guidance or interpretation discrepancies.

21. Create a message map on key aspects and updates of the ITAAC process for external stakeholders. Update message this map on a quarterly basis.

22. Beginning in 2018, conduct additional public workshops as appropriate to further refine and enhance the ITAAC closure process.

5.2 Timely Decision Making

Throughout the demonstration project, timely decision making surfaced as a key factor for success. Additions to the process such as the recommended dashboards and the creation of a temporary organization offer up-to-date information and senior level oversight on the progress of the ITAAC inspection and closure verification process.

The working group also noted that resources may need to be reassigned to areas that require the most attention, such as staff support for critical technical areas during the final months of a unit before its 10 CFR 52.103(g) finding. NRC management is prepared to coordinate the allocation of resources or redistribute workloads to meet the demands.

Recommendation

23. Develop a process that integrates a temporary organization and ITAAC dashboards to facilitate timely decision making on issues associated with ITAAC inspection and closure verification.

6.0 Conclusion

For the ITAAC Closure and Verification Demonstration Project, the NRC staff evaluated the readiness and reliability of the ITAAC inspection and verification processes during the last year of construction for the new units at the Vogtle Electric Generating Plant and Virgil C. Summer Nuclear Station.

The key outcomes from this project are: (1) recommendations for the NRC's ITAAC process and logistical enhancements; (2) communication tools to ensure that licensees and other external stakeholders share a common understanding of the ITAAC closure process; and (3) validation of the primary resources needed to process the expected ITAAC inspection and ICN review surges. The NRC will consider each of the recommendations presented in this report for implementation in accordance with their priority in relation to other mission critical work. Similarly, the agency will deploy the mitigating strategies previously discussed during peak months of ITAAC notification submittals.

The demonstration project provided an opportunity for licensees and other public stakeholders to provide feedback on the staff's progress since the 2011 demonstration. The recommendations identified in this demonstration project will result in enhancements that will refine current NRC processes regarding capacity, agility, and decision making in support of the 10 CFR 52.103(g) decision.

Enclosure 1: Recommendations

The list of consolidated recommendations can be found accessing ADAMS Accession No. ML17144A226

NOTE: That the 23 recommendations included in the body of the report have been consolidated into these 12 recommendations below based on their topics and actions.

Action Item	Lead/Supporting Role
Weekly Public Meetings	
1. Utilize weekly public meetings to facilitate resolution of critical issues associated with ICN and UIN reviews, including items such as the intent of an ITAAC, ICNs with challenges, methods for resolution of issues, and informed decision making. In addition, establish standing agenda items during the weekly public meeting to discuss expected ICN submittal workloads to allow early notification of resource needs and critical process points. Increase the frequency of public meetings to accelerate the resolution of emerging ITAAC closure issues as the surge approaches.	Lead = DCIP Support = DNRL
Clarity in Existing Industry Guidance	
2. Develop an FAQ-type process to provide a forum to document discussions and resolutions of issues associated with the content of ICNs and UINs, which may be due to gaps in existing guidance or interpretation discrepancies. 3. Work with stakeholders to identify complex ITAAC issues by reviewing early submittals of uncompleted ITAAC notifications and develop clear expectations for the content of the associated ICN submittals. This effort will include identifying when complex ITAAC will be completed during the construction schedule.	Lead = DCIP
NRC Processes Guidance Enhancement	
4. Revise applicable NRO office instructions to ensure lessons learned and enhancements for the ICN process, identified during this demonstration project, are institutionalized. The revision should include, but is not limited to, the development of the criteria of when technical reviewer referral is needed during the reviews of ITAAC notifications, the evaluation of the requirement of completing half of targeted ITAAC before completing verification of non-targeted ITAAC within an ITAAC family, and the involvement of technical staff for all ITAAC notifications related to security and emergency-preparedness. Lead = DCIP Make the revised NRC office instruction NRO-REG-103 publicly available to give stakeholders insight into the NRC's ITAAC notification review process. Lead = DCIP.	As stated in individual item

5. Enhance NRC processes, including associated governing documents, communications, and training, to ensure timely identification and resolution of concerns or findings material to ITAAC, such that ITAAC inspection results support key activities and milestones in the ITAAC closure verification process. The recommended activities should focus on the timeframe between the beginning of the ITAAC surge and the 10 CFR 52.103(g) finding. Lead = DCIP and RII. a. Enhance/develop the following processes: TARs, URIs, ITAAC inspection findings, allegations and petitions, and IPCNs. For TARS, consider the frequency of performing this process; the timeliness of TAR processing; and interactions with licensees for visibility purposes. Lead = DCIP/CIPB, Support = RII b. For inspection findings, consider enforcement actions and internally and externally disputed findings. Consider which NRC process activities, if any, can be done in parallel with the evaluation of an ITAAC technical concern. Lead = DCIP, Support = RII.	
Performance Dashboards	
6. Create an integrated, highly visible, internal, color-coded performance dashboard to track the status of each step for ICN reviews and inspection process, including the timeliness of report issuance, inspection initiators, and inspection outcomes, for early identification of ITAAC closure inspection related issues for management attention and resolution.	Lead = DCIP Support = DNRL
External Stakeholders	
7. Create a message map on key aspects and updates of the ITAAC process for external stakeholders. Update this message map on a quarterly basis.	Lead = DCIP
Inspection Scheduling	
8. Determine the most efficient location and time for inspections. Continue to focus on short-duration construction activities, such as installing the reactor vessel, which are unlikely to be repeated for additional inspection opportunities. Additionally, verify that test procedure inspections are scheduled when procedures are issued and available versus when the tests are being performed.	Lead = RII Support = DCIP
Timeliness of Inspection Reports	
9. Establish timeliness requirements for inspection disposition including inspection completion in CIPIMS and inspection report issuance to support the ITAAC surge and the 10 CFR 52.103(g) finding. Lead = DCIP and RII.	As stated in individual item
Organizational Structures	
10. Establish a temporary organizational structure with senior executive leadership approximately 12-months before projected fuel load. This organization would oversee and coordinate the ITAAC closure verification process to ensure appropriate decision making and the prompt identification and resolution of issues.	Lead = NRO

Maintain Qualified Staff	
11. To ensure continued ICN review and inspection capacity, cross-train additional staff to support ICN workflow capacities and ITAAC inspections. For inspector qualification, the NRC will incorporate construction inspector training into IMC-1245 and continue cross-qualification for inspectors at plants operating under 10 CFR Part 52.	Lead = DCIP Support = DNRL
Public Workshops	
12. Beginning in 2018, conduct public workshops as appropriate to further refine and enhance the ITAAC closure process. Lead = DCIP.	DCIP

Enclosure 2: Presentation Slides

Presentation slides can be located accessing ADAMS Accession No. ML17110A359